GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

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STRAY STRAWS FROM DR. C. C. MILLER.

A CORRESPONDENT wants a recipe for curing pork with honey. Who knows how?

EDITOR YORK says that, as nearly as he can discover, there were 1,200,000 pounds of honey put on the Chicago market last year.

THE *Progressive Bee-keeper* now flings at its mast-head the name of G. M. Doolittle as one of its editors. If that isn't *progressive*, I don't know what is.

THAT'S A SHABBY TRICK played on the readers of GLEANINGS by Walter S. Pouder, p. 67. He says, "See that wink?" and as long as I watched that girl she never winked once.

THE ROYAL AGRICULTURAL SHOW, to be held at Manchester next June, is beginning to stir British bee-keepers. A large number of prizes are offered to bee-keepers, ranging from $1.25 to $75.00.

IT'S ALL RIGHT to encourage the invention of new hives and new appliances, but at the same time it's a kindness to say to every beginner who has kept bees only one season, "Don't invent a hive just yet."

THIS WINTER is a bad one for me in one respect. I have 10 colonies wintering outdoors as an experiment, and the winter is so mild up to the middle of January that hardly any colony would be fool enough to die on its summer stand.

EDITOR THEODOR WEIPPL, after quite a discussion in *Bienen-Vater* as to the standing of the swallow, gives his verdict against it as an enemy of bees. On cloudy, rainy days its frequent visits to the hives mean death to some of the workers.

HONEY-AND-TAR COUGH-CURE. Put into boiling water a shallow tin dish containing a tablespoonful of tar. When the tar is hot, add a pint of extracted honey, and stir well for half an hour, adding to it a level teaspoonful of pulverized borax. Keep in a bottle well corked. Dose, a teaspoonful every 1, 2, or 3 hours, according to severity of cough.—*Dr. Peiro, in American Bee Journal.*

P. SCHACHINGER estimates that, when a colony of 20,000 bees stores a pound of honey a day, a colony of 40,000 will store 4 pounds. Twice as many bees, four times as much honey. [I believe that most of our American bee-keepers would consider this as a fair ratio.—ED.]

VERY DECIDEDLY a package of honey to retail at a dime is a good thing, provided we can get the bees to store as much honey in such light sections. For some time I've been advocating a section so light that it will be impossible for a dishonest grocer to sell it for a full pound. [See answer to another Straw on this subject.—ED.]

EDITOR VOGEL says the bee-larva is fed 12 times in 24 hours, or once every 2 hours. If there is never any superfluous food in a worker-cell, it seems a pretty safe deduction that worker brood can not be kept away from the bees longer than 2 hours without injury. Indeed, a much shorter time might hurt; for the 2 hours of some of the little chaps might be up just about the time of removal from the hive.

THE *San Antonio Express* reports that "experiments made with smallpox patients in Oaxaca, Mexico, show that, by administering honey diluted in water to smallpox patients, the pustules of the worst variety disappear, and the fever is immediately diminished." If that isn't a newspaper yarn it's worth knowing. [I saw this item, but jumped to the conclusion that it was a newspaper yarn, without any real foundation. If any of our subscribers can enlighten us, I should be glad to have them do so.—ED.]

THE *American Bee Journal* starts out with the new year by turning over a new leaf in the way of reform. When "ed" has the sound of "t" in the past tense and participle, "t" is printed. *Progressive* also talks about clipt and unclipt queens. Any movement to help our abominable spelling ought to be hailed with delight; but at first a good many will not be "shockt." [Yes, it certainly is a move in the able to meet the new spelling without being

right direction, and the editors of GLEANINGS have seriously considered the same move. If Bro. York's subscribers do not protest, we may follow suit.—ED.]

"IT COSTS TWO POUNDS of honey to rear one pound of brood; and as a Langstroth frame is capable of containing two pounds of brood, I hold that one such frame of brood costs four pounds of honey." That's R. L. Taylor's notion in *Review*, and I'll pin my faith to it till something different is proved. And I suppose a frame of *drone* brood costs about five pounds of honey. [Nothing unreasonable or improbable in this; if, therefore, it does cost 2 lbs. of honey to rear a pound of brood, bee-keepers should be careful not to allow brood-rearing to go on out of season. The thrifty Italians will seldom if ever waste their energy in this way.—ED.]

IT IS A NEW THING to me that "bees will not work upon a section with full-depth cells as readily as they will upon new foundation," as stated by friend Martin, p. 43. I know that my bees *have filled* full-depth cells many a time before working new foundation, when the yield is poor, and they always commence on the full-depth cells first. If B. Taylor were alive I think he would deny that he used the leveler because he wanted shallower cells. Friend Martin, wasn't there something wrong with your full-depth sections? [We tested this matter pretty carefully in our apiary last summer, and *invariably* the bees took the drawn comb first, then afterward the foundation. What I mean by "drawn comb" is some that had been leveled down to cells about $\frac{3}{8}$ in. deep. This seems to have been the experience of the great majority of other bee-keepers.—ED.]

PROF. COOK is getting to be revolutionary. He says in *Am. Bee Journal* that he thinks a swarm never goes with a young queen when she goes forth to mate. That in all such apparent cases it was merely a swarm issuing, and the queen accompanying or following. I wonder if that's another of the things we didn't know but thought we did. [Prof. Cook may be right, but it does not look reasonable—to me at least. Time after time I have seen young nucleus swarms go out with a young queen not yet fertilized. In some instances, according to my observation, they come back with the queen. Their very small quarters, I have thought, made them discontented; and when the queen went out they simply "lit out" with her, probably assuming that any quarters would be more agreeable than the ones they were having, so cramped up.—ED.]

A QUIET SMILE, I fancy, must spread over Prof. Cook's face as he notes how a late article of his is having the commendation of the bee-journals, in which he says the bees "digest" nectar, and then remembers what a howl was sent up when he made the same statement once before. It's not safe, professor, to get too much ahead of the times. I remember a man getting into trouble once because he said a bee-keeper ought to have legal control over the territory his bees occupied. He merely said it a few years too soon. [Yes, the renowned Galileo got a little ahead of the times, and they made him recant; but he was of the same opinion still. On the subject of digested nectar I do not think GLEANINGS ever took issue with Prof. Cook. While perhaps we did not indorse him at the time, we did later on. More and more the facts go to show that bees do actually prepare nectar in such a way as to make it more easily assimilated by human beings than ordinary sweets. In my own case, for instance, I can eat honey without any inconvenience; but I can not eat cane or maple-sugar syrup. This I know to be true of a good many others. I do not, however, think, as some do, that an admission that bees convert or change sweets is also an admission that sugar honey is a legitimate article of sale, for this reason: Raw nectar, as it is gathered from the flowers, is taken very slowly, a little at a time, and is digested by the bees. Syrup, as it is ordinarily fed to the bees, is taken so rapidly that they have little time to prepare it or digest it, therefore sugar honey should not in any sense be classed as honey. In talking with Mr. R. F. Holtermann, of the *Canadian Bee Journal*, this week, I found he was of the same opinion.—ED.

I'M DISCOURAGED—almost. You box my ears, Mr. Editor, on p. 42, for *persisting* "in saying the plan of selling thin sections is thievish," right after my saying, "I'm for thin sections just as much as you," and when I never for a minute thought it was thievish to sell them. [I should not be surprised, doctor, after we get through talking, that we shall be found to be actually on the same side of the fence. I do not think I misunderstood you; but unwittingly I made you, perhaps, stand sponsor for things which you did not; but in your previous Straw on this subject you say you are condemning "the thievish plan of selling light-weight sections for *full pounds*"—italics mine. It seems to me right here you are going on the wrong assumption that light weights are sold for *pounds* even generally; and you very properly say that retailers selling such for pounds are dishonest. Right here we surely agree, if not on all. But from the best information I can get, retailers almost universally sell by the *piece;* in fact, I do not believe that consumers or purchasers have any idea of the weight of a section. It is the price and not the weight that is prominent in their minds; hence I can not see *how* there can be any thing thievish about selling light-weight sections, for the average consumer, when he buys honey, does not have in mind a pound but a certain chunk of honey which he sees before him.—ED.]

DRAWN COMB.

ITS VALUE TO THE BEE-KEEPER; SPRAYING TREES DURING BLOOM PROHIBITED IN VERMONT.

By J. E. Crane.

I have noticed with considerable interest the discussion in GLEANINGS in regard to the use of drawn comb. I have used such comb more or less for the past thirty years, and do not think the estimates of its value are at all too high. There are two or three advantages: The bees will fill them quicker, commence working in the sections sooner, and, if a row is placed on the outsides of the clamp in the first part of the honey season, these will be filled and finished nearly or quite as soon as those filled with foundation in the center of the clamp.

A little care should be used to produce the best or fancy combs of honey with these drawn combs. They should all be cut down if they are more than one-half or three-fourths inch thick. If not cut down, the bees hesitate about sealing them; and when sealed they are very apt to have a soiled or dirty appearance.

After the honey is extracted from such combs in the fall I place them in clamps and put them on top of some hive so that all the honey may be taken out dry and clean by the bees; for if any is left, the next crop of honey when put into these cells is more apt to granulate.

I much prefer a knife for this purpose to melting them down, as the center of the comb is very liable to be quite to one side of the center of the section; and with a knife fitted for the work, one can cut down 200 per hour or more. I like to cut them down so as to leave the lower edge thinner than the upper part of the comb, so as to be nearly as the bees would build a thin comb. I like a Bingham & Hetherington honey-knife for cutting down, fitted for the work by first cutting the knife down or off nearly one-half its length, and beveling the edge square across like the sides. I have several thousand such combs cut down and carefully stowed away for next year's use.

Inclosed find copy of a law recently passed by our Vermont Legislature. Such a law should be on the statute-books of most of our Northern States. Spraying apple-trees while in bloom has done our bee-keeping much harm here in Vermont. The law reads:

It is hereby enacted by the General Assembly of the State of Vermont:

SEC. 1. If a person sprays or causes to be sprayed, or puts or causes to be put, any Paris green, London purple, or other poisonous substance upon fruit-trees while in blossom, he shall be fined not more than forty dollars, and not less than ten dollars.

SEC 2. This act shall take effect from its passage.

Approved November 20 896.

Middlebury, Vt., Dec. 23.

[The comb-leveler put out by the late B. Taylor, so far as I am able to gather from those who have tried it, levels the comb down perfectly, clear across their bases. I do not see how a knife could do it as quickly or as well; but perhaps it does.

The Vermont law is brief and to the point. Michigan already has a similar law, and several other States are moving in the same direction. All it needs is for bee-keepers to properly instruct their legislators to give similar laws for every State. If a law were once on the statute-book it probably would never have to be enforced. Its moral influence would be sufficient to prevent spraying at the wrong time of the year—ED.]

DRAWN COMBS FOR SURPLUS-BOXES.

WORK IN THE BOXES BEGUN SOONER; PREVENTION OF SWARMING.

By F. A. Snell.

This subject of drawn combs has received much attention the past few years, and it is an important matter; and as I have had some experience along this line I will give some of my ideas. There is no doubt in my mind as to these combs being valuable to a certain extent. In each row of sections I very much wish to have about three of the central ones contain drawn combs, to be put on each hive run for comb honey at the opening of the surplus-honey flow. I find work is begun sooner than when only foundation is put in. All colonies will begin sooner, and with some a difference in time of a week or more. In others it will make a difference of swarming or no swarming for the season. The apiarist with long experience is aware of this. A point that no comb-honey producer should overlook is that of getting his bees started in storing in the supers; and every inducement should be made to this end so as to secure such. Once well at work in the boxes, more supers added at just the right time will do very much to prevent the swarming impulse, and thus secure the largest possible amount of surplus honey.

These supers, with the central drawn combs, should be put on a little before there is a probability of there being honey stored in them—say three or four days. Never be too late in doing this work, or the swarming-fever may have taken possession of the bees, and then it is too late; for swarm they then will if the honey-flow be a good one. These drawn combs should not be over 1½ in. thick, I think, as the outer ends of the cells should be made from new comb. My experience has been that comb honey is nicer where the comb is newly built, and I have often sampled that of the two and compared the quality. With me the new is always preferable in both comb and honey. I should not like to dispense with the central drawn combs, nor use such in all boxes.

One thing I have often observed, that I have no remembrance of seeing mentioned, is this:

Some combs in the supers are built very thick at base and side walls; others at other times

will be made thin. I think the reason is this: During a good honey-flow the bees wish the wax secreted to go as far as possible in holding the honey being so freely gathered. At other times, as the flow for honey is slacking up after a good yield, the workers, having a very large amount of comb material at hand, and little need of comb, build the combs very heavy, seemingly to save the secreted wax. Such combs are often very heavy, and should be well cut down if used in the supers. I believe, as the queen is crowded for room at the opening of the honey-flow, that the bees remove some of the honey from the brood-chamber, and store it in the drawn combs in the supers; whereas the newly built comb is filled with newly gathered honey, which would account for the better flavor of the latter when from clover or basswood bloom. I have many times noticed that the first extracted honey taken in June was not as fine in quality as that of the second extraction. I account for this the same as above mentioned. The combs being built, some honey was moved from the brood-chamber below, stored the previous autumn.

I have read the articles on drawn combs with much interest, as they have from time to time appeared in our bee-periodicals.

Milledgeville, Ill.

[Yes, I believe that, if drawn combs were given soon enough before the bees began to feel the need of more room, it will go a long way toward solving that vexatious swarming problem. Combs should not, I think, be anywhere near 1½ inches thick. If any thing, they should be less than 1 inch, and ¾ would not be bad. All the bees require is a *good* start. —ED.]

DRAWN COMBS AND BAIT COMB.

ADVANTAGE OF DRAWN COMBS IN POOR SEASONS; A LARGE HIVE.

By E. H. Schœffle.

I was under the impression that the use of drawn combs in securing comb honey in "off" years was common; but from late articles in GLEANINGS I see that it is new to many. The fact that bee-keepers working for extracted honey have a crop when comb honey is a failure should have suggested this to every one. That "bait" combs are a good thing, has been generally admitted. In the season of 1895 the honey-flow was very strong up to March, and the sections had their combs well drawn out, and many of them full, when the flow ceased and the bees emptied them of their entire contents. During the remainder of the season the bees just about made a living. This left me two thousand sections filled with comb. This season I put all of these sections on. The flow was very poor, but the sections with drawn combs were all filled, while no comb was made in any of the other supers, nor did any of the other bee-keepers in the section (who make only comb honey) have a pound.

It has always been a question with me whether it pays to take comb or supplies from a strong colony to stimulate a weak one. Garfield once said that "a man who can't save himself isn't worth saving," and I sometimes think a colony of bees that has got too weak to help itself is not worth robbing a strong colony to feed it. To get drawn combs, the stronger colonies must be kept at comb-building, and in consequence no honey is secured from them; but for this I should like to have all bees at work filling and sealing over drawn combs. In a good season, when the bees "just roll in the honey," I don't see the need of a drawn comb, as every hive is then the equal of every other hive, and the bees are all of one mind and intent, and the favored bee-keeper has but to keep the "busy bees" supplied with empty sections as fast as the bees fill them.

Of one thing I am becoming more and more firmly convinced; that is, the conditions differ with the locality. A system that is a success in one section may be a dismal failure in another. For some time past I have been convinced that a large hive was best adapted to my section, and the past season I have tried a hive 18x18x36 inches. Over this I put one of equal size; and over that, one of half the size; and although it was an "off" year this hive did better than any hive in the apiary. Now, I don't intend to increase all of my hives to that size; but I believe we cramp our bees too closely, and I shall try a 12-frame hive the coming season.

Murphys, Cal., Dec. 26.

[I have given above three articles from bee-keepers who believe thoroughly in the use of drawn combs. I have more of them, and will give them later. In the mean time I should be glad to hear from others who have not yet written.

In the paper which I gave at the Lincoln convention, after enumerating some of the advantages of the drawn comb, some of which are given above, I expressed the hope that some Yankee genius would get up a machine that would make deep-cell foundation or shallow drawn comb with cell-walls and bases as thin and delicate as the natural; but at the time, several expressed their doubts that any such thing could ever be made. For reasons that I will not now give, I did not then wish to make public the fact that we had *already* made in our establishment drawn combs, and had tested them during the previous summer in the apiary, and *that the bees accepted them at once.* This comb had cell-walls and bases nearly as thin as the natural, but the bases were flat. I showed samples of it to a few friends at Lincoln, and they could hardly believe that it had been turned out by machinery. Others, to whom we had sent samples a year ago, expressed the same feeling of surprise and pleasure. The bees not only accept this comb, but deposit honey in it immediately, draw it out and cap it over, and in some cases before they even *touch* foundation in sections next adjoining in the same super.

During all this time we have been working on larger machinery, but have hesitated about saying any thing in print until we could have some assurance that the new article was a commercial possibility. While we are not fully assured of it yet, we have turned out samples large enough to fill sections, and have sent them around to some prominent bee-keepers. We have received quite a number of letters, but will quote from only one of them. Here is what Hon. Geo. E. Hilton says:

Mr. Root:—The sample of new foundation comb has arrived, and it is simply *superb*. I believe it will produce comb honey that can't be beat. I have great faith in it. If it will give us plump well-filled sections, as I feel it will, the price will be no object.
Fremont, Mich., Jan. 25. GEO. E. HILTON.

This is only a sample of a lot of other letters of a similar import. At present we are able to turn out only samples to illustrate the possibilities of the future. For 10 cts. in stamps we will try to mail every applicant a piece of the comb, providing we are not flooded beyond the capacity of our outfit. In the mean time we are at work on more elaborate machinery. Until we know what this can do, I will not say any more; suffice it, that we *hope* in the near future to be able to supply, to a limited extent for orders, drawn combs with cell-walls as thin at the natural, having flat cell-bottoms. And right here we found where the cell-walls were deep and as thin as the natural, that flat bases were as good as the natural bases, and far easier for us to make.

I need hardly add that the presiding genius in the evolution of the new deep-cell foundation is none other than E. B. Weed, of foundation fame. He has been working on the problem for years, but it was only within the last two years that he struck the right track. That he should stick and hang to this will-o'-the-wisp of artificial comb in spite of repeated failures, lack of funds, in the face of discouraging editorials in GLEANINGS, and other journals—well, the man should reap the rewards of his labor. But more anon.

Perhaps some may think there is nothing in drawn comb, providing we can make it. I felt so too, at first; but when I saw how the *bees* felt about it, I changed my mind. Mr. Weed was given the free use of the whole apiary to test his new comb, and he demonstrated beyond a doubt that the bees would fill it with honey *immediately*, and at the same time join on their own comb, making the whole one homogenous mass; and the only way in which the artificial could be detected from the natural was by the cell bottom—the artificial being flat.—ED.]

PRINCIPLES OF HONEY-CONSUMPTION; POSSIBLE APPLICATIONS.

SUGGESTIONS FOR SMALL TWO-OUNCE HONEY-PACKAGES.

By F. L. Thompson.

The contrast between the average man's conception of honey as a delicacy, and his obtuseness to the opportunity of buying it at the grocery, is really painful. Why is it? Does he not repeatedly crave, taste, and admire the honey-comb on the table of his country cousin? Is not the opportunity to "rob" a wild swarm hailed with rapturous delight by all who do not know a drone from a worker?

It is not entirely the fear of adulteration, for the average man swallows quantities of glucose without winking (and knows it too), in the shape of "maple" syrup. Without pretending to exhaust the subject, two considerations have a bearing on this point. One is the pertinacity with which said average man surfeits himself on the rare occasions when he does eat honey. The other is the smeary nature of honey itself. Practically, the housewife and the eater should, and perhaps do, handle honey dishes, knives, and spoons without much trouble, with a little care; but that is not the point; it is the *idea*, as the woman said of the mouse. Honey, in the popular mind, is very nice, but dreadfully sticky—not that many go to the trouble to think out all this, but a prejudice may be both subtle and forcible at the same time.

One remedy for stickiness would be to have honey in the form of small confections, as clean and easy to handle as gum-drops. "But the honey taste?" There's the rub. Still, it is worth thinking about.

Honey candy is a superior article, but not exactly honey. Granulated honey deserves consideration. True, it can not be molded like confectioners' sugar; but by watching a can of honey until it is seen to be in the first stages of granulation, then pouring it into shallow pans duly greased or oiled, or lined with paraffine paper, then setting away for a few weeks, it may be cut up when hard (employing some care, so as not to split it in the wrong place) into little nuggets, providing the layers are not over ½ or ⅜ inch thick. These may be wrapped in twists of paraffine paper (with a soft motto inside, perhaps), and set away in a cool place until disposed of. Most grocers keep candies. Possibly a special grater or masher would put hard granulated honey in the right condition to make chocolate drops.

This is not just the thing, either. It could be done in Colorado, but I do not know whether it would work in a moist climate. Then, too, some honeys do not granulate at all, and others do not granulate in the right way for that purpose. Unless coated with a foreign substance, the product would still cause sticky fingers.

Mr. F. Rauchfuss suggested to me lately that a field which has never been worked is some method of rendering granulated honey perfectly dry, like what is left on the bottom-board of a hive after the bees have robbed it out. This would make an article very easy to handle and ship, and perhaps extend its uses in confectionery. It might be done before granulation is quite complete in some such way as molasses is removed from loaf sugar.

Still, granulated honey does not produce just the same effect in the mouth as liquid honey. After all, the most important requirement is to fully satisfy the popular idea of honey. A few years ago I procured a large size of gelatine

capsules, and experimented in filling them with honey. The results were not satisfactory. The gelatine produced a highly disturbing effect in the mouth by first breaking into brittle and glassy pieces, and then, after the honey was gone, dissolving with a coarse material flavor that quite obliterated the ethereal gusto of the honey. I then made some paraffine capsules by means of two sticks for molds, one a little larger than the other. These were too fragile, and left too much residuum in the way of chewing-gum. I had some thoughts of attempting to make capsules of honey candy, but gave it up as too difficult on a large scale, without the proper appliances. Moreover, such a confection gives too much prominence to the candy at the expense of the honey, for the honey disappears quickly and the candy slowly. What is wanted is a comparatively tasteless envelope, disappearing quickly. I have heard that "bonbons filled with liquor" are common in Germany, so I suppose there are such things on the market, which could be adapted to our needs by substituting honey for the liquor. Can it be done cheaply enough? Only a confectioner could tell.

Very likely machinery would be needed, placing it beyond the power of the bee-keeper to manufacture. Here is a chance for those Medina machinists. Think of the combination —"The So and So Company, manufacturers of bee-supplies and honey confections," which means that the power, the machinery, the honey knowledge, the direct communication with bee-keepers, and a peculiar interest in the the product, such as other manufacturers could not have, are all in one.

The plan of dividing honey into mouthfuls, however, does not preclude a possible surfeit. The mouthfuls may be too often repeated, and then—"No, thank you; honey does not agree with me," or, "I used to think there was nothing like honey, but somehow I have lost my taste for it." Some will say this is laying too much stress on a small point. I do not know about that. It is true, honey is like a staple to some people—Mr. E. T. Abbott, for instance, who eats it 1095 times a year; but do we not all know of families on whose tables honey may be placed every meal, without being touched oftener than once a month by about half the family? I know of two or three just such families; and from remarks of my customers I suspect the existence of many similar ones. Now, it may be just a notion of mine; but I suspect that, if once a day a little dab of honey, just a taste, were placed by the plate of each person, that little dab would generally be eaten. There is no dislike to honey, as a rule; it is just indifference; and if such individual portions would generally be eaten, it needs only a little arithmetic to show that the consumption of honey would be vastly increased. Just secure the fate of the average individual portion, and the mass of honey follows.

What are the motives which lead the average person to accept or refuse honey at the table? First, it must generally be regarded as a tidbit, or part of the dessert. To push it as a staple, I am satisfied, will lead many to reject it entirely. Its delicate aroma is best appreciated by small tastes, and is deadened by ordinary bites. Not only, to many palates, is it thus reduced to the level of ordinary food, therefore regarded with indifference, but these are generally the people on whose stomachs it "sits heavily" in large doses, creating a slight feeling of repugnance, thus sealing the fate of the next twenty-nine chances of honey consumption. Second, given this feeling of indifference as a result of too free previous indulgence, the choice between eating and not eating any food depends on the quantity in which it is offered, and the ease of obtaining it, say in the midst of an animated conversation. To particularly ask for something they do not care for is what most people will not do; and, even when presented, the sight of a great block of concentrated sweetness reminds one too vividly of the cause of his indifference. But to casually rummage around with a spoon, and unconsciously, perhaps, take a taste here and there of what is immediately before one, is the easiest thing in the world, and, at the same time, the best remedy for that indifference in the case of honey; for in this way it gets a chance to reassert its superiority by the free play which only leisurely tastes can give its elusive flavor. But the individual portions must be small, or these advantages are lost. It is not the bulk of honey eaten at one t me that tells, but the frequency with which it is consumed. If at the table there are any persons who eat honey as they do molasses, they can ask for more. But these people, when they become bee-keepers, should not lay down the law for all others. I don't believe I could survive a continual diet of corn bread and bacon, even if some Southern people do grow fat on it.

[Since the above was put in type the following has come to hand.—ED.]

I recently sent in an article, suggesting, among other things, that gelatine capsules be used for individual portions of honey. But a prominent firm of manufacturing chemists, to whom I wrote about the matter, replied: "The manufacture of empty gelatine capsules requires expensive molds and machinery, and it would not be practical for any one to make them unless in very large quantities—a million and upward." That settles that. Here is another suggestion: For little chunks of comb honey, it is possible that transparent adhesive paper (such as is used for patching leaves in books), so as to be capable of folding into a miniature *tight* carton, would be cheap and

satisfactory, and would show off the honey something as gelatine would. It would certainly be very desirable to retain the feature of transparency in the package, no matter what it was made of.

Denver, Col., Jan. 19.

Concluded in next issue.

RELATIVE MERITS OF THE WIRECLOTH AND PORTER ESCAPES.

REQUIREMENTS OF AN OUTDOOR BEE-ESCAPE.

By F. Greiner.

The Porter escape has perhaps found more favor among our bee-keepers than any other form of escape, and still there are others that work very satisfactorily, and for some purposes are even better than the Porter. The latter is constructed on the spring and cone principle combined, and it is absolutely impossible for even a single bee to work back through it. This feature makes it most valuable when the escape is used on the hive between brood-chamber and full super. Our other escapes, with the exception of the trapdoor escape, which is in principle somewhat like the spring escape, except that the force of gravitation is made use of instead of the spring, are constructed on the cone and labyrinth principle; and as we increase the number of the different sets of obstructions the surer we are that no bees will work back.

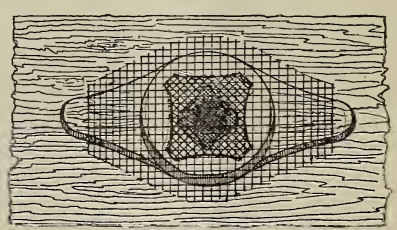
If we take a look at the under side of one of these escapes while in operation on the hive we find it is completely covered all over with bees, and, of course, a few of them are right on the apex of each flattened cone, and are liable to work in. When they have entered the cone, other bees from below take their places; some may also work in, and so on until finally the first chamber inside between two cones is crowded with bees. It is apparent that, the larger or roomier this chamber is, the better; for not until it is crowded with bees will some of them be very likely to occupy positions at the apex of the next cone, and have occasion to enter that also. After a while the second chamber will also be crowded with bees, and then a few bees will get into the full super.

It is, perhaps, not entirely settled how many consecutive cones it is necessary to use in the construction of one of these escapes to make it work perfectly on the hive. Mr. Dibbern claims his last bee-escape, illustrated in Nov. 15th GLEANINGS, does work to perfection, and perhaps it does. It is built with three sets of obstructing cones, and has large spaces between them, the entrance and exit holes being some 10 or 12 inches apart. It does not let the light in, and is for that season best adapted for use on the hive and not so well on a stack of supers. I have made up a few of these "Rapid" escapes, and shall give them a trial next season.

A few years ago I received, through Mr. Dibbern's kindness, an escape in principle somewhat like his "Rapid," but reduced in size to 5x7 inches. It was constructed in such a manner as to make it necessary for the bees to pass six sets of obstructions. It was indeed a labyrinth, and I don't believe a bee has ever found its way back through it. It has stood the test of several years perfectly, and I consider it in every way the equal to the Porter except in cost, and perhaps the same may be true of his "Rapid" escape, which, it will seem, is too expensive, taking more material in its construction, and requiring more time to make up.

Dibbern's four-point escape has served a good purpose, and I consider it to this day the best for use on a stack of piled-up supers; and if made roomy enough—that is, with enough space between the different cones, it can not be excelled for that purpose.

According to my idea, the requirements of an escape to be used out of doors on a stack are: 1. It must let the direct light fall in to attract the bees; 2. Its exits should be some distance from this place, admitting the light, say, at least three or four inches As the four-point Dibbern has a diameter of only three inches, its exits are only a little over one inch from the center hole; and when the bees from a stack of piled-up supers begin to escape, robber bees collect and try to gain admittance. The scent arising from the honey within is strongest right over this hole, and robber-bees pitch for it in a lively fashion, and soon cover the whole three-inch escape in a way to nearly prevent the bees from within escaping, some robbers even gaining entrance at the points. Now, if the exits were located some four inches distant from the center hole, there would be little or no trouble. The bees could then constantly escape, as the exits would be unobstructed.



As soon as this became apparent to me I thought of adding to the four-point Dibbern, which is a double-cone escape, another cone, locating the exits sufficiently far from the center to obviate the trouble spoken of.

The regular D. escape occupies only a bee-space in depth, and requires only a ⅜-inch board (with a bee space on one side). Instead, I have taken a ¾-inch board, cut a 4-inch circular hole in center, for the four-point escape, and then with chisel, etc., I cut away half the

thickness of the board in a double cone shape, as shown in the drawing. Over this I tacked wire screen, making the exits eight or more inches apart.

The now three-cone escape is all inside of the ¾-inch board, and is well protected against all injury. I have used such escapes ever since the escape has come into use, and they are just as good to-day as ever. I like the Porter spring escape for use on the hive, but would not want to be without my thus arranged four-point Dibberns.

I now want to speak of some difficulties arising from and connected with the use of bee-escapes, and I greatly desire that wiser men would give us a remedy for which, I am sure, we all should be very thankful.

When escapes are used on a pile of stacked supers, it will be noticed that the bees inside pass out the honey to the robber bees outside, especially if no bee-space separates them; but even in an escape like the one illustrated, the same thing occurs. Indeed, even bees that have come out of the escape are often followed up by robbers, and harrassed until they give up the sweet they are loaded with. Sometimes half a dozen bees can be seen at once, being fed by one loaded bee. This keeps up the excitement, and it is for this reason always best to wait until the bees have ceased to fly before carrying the honey to the house.

When escapes are used on the hive, another and much more serious trouble occurs. I refer to the capping being gnawed or perforated, principally of the central portion of the section of the super next to the escape. It does not occur in every instance, and much more so after the honey season has closed; it injures the looks of the honey very materially. I should be glad if I understood this matter. Who can tell us why bees act so in one case and not in another?

Naples, N. Y., Dec. 15.

PROTECTION FROM ADULTERATORS OF HONEY.

A VALUABLE AND SENSIBLE SUGGESTION.

By. Wm. G. Hewes.

I would suggest, as one means of protecting ourselves from the adulterators of honey, that we make an effort to have Congress place an internal-revenue duty on glucose of two or three cents a pound. The coming Congress will have to take steps for increasing the revenue, and it is not unlikely that, if the matter is brought to their attention, they will acquiesce in our wishes—especially if we are backed up by the producers of cane, beet, and maple sugar, all of whom suffer by having their syrups adulterated. As to the extent to which sweets are adulterated with glucose, we have but to refer Congress to the government chemists. Glucose, I believe, is valueless as food; is of no value in the arts, and is manufactured for swindling purposes only.

There are but few apiaries in this locality which do not have to be fed this season. Two of mine are among the lucky few, and one I have to feed. I see in the Nov. 15th GLEANINGS that Doolittle says feeding is not to his liking. Until I read that I always thought that feeding bees was an eastern bee-man's idea of supreme enjoyment, seeing how often it is recommended by them to extract all the honey and then feed sugar.

I have various kinds of feeders, but find nothing better than a lard-bucket or other vessel with a few bits of comb floating on the syrup. wooden feeders are apt to be leaky; and with the Miller feeder, unless it fits the super very snugly, many bees will be drowned. The "division-board" feeder, described in Doolittle's "Queen-rearing," is excellent; but instead of making it the width of a frame I make it three inches wide, and have floats in it.

I have also practiced elevating the front of the hive, and pouring in syrup at the entrance; but that was the most unsatisfactory of all methods, as so many of my hives leaked.

I have been painting the cracks in some leaky hive-covers with asphaltum, and think it a rather good idea where the hives are kept shaded, but not otherwise, for the heat of the sun would cause it to melt and run through on to the combs. Probably if it could be whitened it would not melt; but paint does not seem to stick to it, for some I gave two coats to is still a magnificent jet.

I should like to see how Mr. Frazier figures out a profit on ten-cent corn. Seventy-five bushels an acre is only $7.50. No great profit, even if it were clear gain. Take from that the cost of growing, harvesting, shelling, and sacking, and I can not figure out profit enough to pay taxes. Some people are so peculiar that, if the leaders of their political party tell them they are prosperous, they will promptly accept it as a fact, and proceed to take on fat.

The prospects for prosperity among California bee-keepers are not very brilliant. With half the bees in the country dead, and no honey gathered now for eighteen months, one would think the price would be good; but it is only four cents for best, and not ready sale at that.

Speaking of prosperity, the *American Agriculturist*, in its Western edition, after telling us what prosperous fellows the farmers of New York are, makes the precious statement that the trouble with the West is that the people are lazy, and have not banks enough!

Newhall, Cal.

[Your suggestion along the lines of throttling the glucose evil is the most practical one I have seen yet. Here is a chance for work for the new Bee-keepers' Union. If it is a fact that

glucose is valueless as a food, and is of no use in the arts, and is manufactured only for the purposes of swindling, then I can not see why bee keepers, in connection with the producers of cane, beet, and maple sugar, can not, through their Members of Congress, some time in the future, have an internal-revenue duty placed on glucose at so high a rate that it can not be used for adulterating. We may do well to ponder this suggestion.—ED.]

SECTION SUPER WITH PATTERN-SLATS.

THUMB-SCREWS VS. WEDGES FOR PRODUCING SIDE COMPRESSION.

By C. Davenport.

Some time ago in GLEANINGS I described a super that I prefer, which is a case just long enough to take in four rows of sections, and deep enough to take in the section and pattern-slats, and yet allow a bee-space. These pattern-slats have no end-pieces, and in your foot-notes you say that, without end-pieces, the pattern-slats are liable to get skewed, and then the openings in some cases will not come together in exact alignment, which makes them, "the openings," very much narrower.

I do not believe you understood what I meant; for with scalloped pattern-slats the separators drop down between them; or even without separators the follower and wedge will hold them in place, so that it is impossible for me to see how the openings can get out of exact alignment.

After a more extended trial of these supers the past season I prefer them to any others. They are superior to those having end-pieces on the pattern-slats in every respect, so far as I can see. Those thumb-screws which you advertised last year for the first time are decidedly better in every way, in my opinion, than a wedge is for tightening sections in the supers. I thought, when I first saw them described, they would be a good thing; and after using 30 supers that had them, the past season, I find they work even better than I expected them to. In producing section honey I regard it as very important that the sections be wedged up very tight sidewise; for if they are not, in this locality at least, the edges of the sections will be very badly stuck up with propolis, and the edges are the hardest part to clean; besides, propolis from the edges will often, when it is being removed, get into the cells of unsealed honey next to the edge. This injures the appearance of the honey, and does not improve its flavor, to say the least.

With one simple wedge it is impossible to tighten the sections much. I use two wedges for each super, and drive them quite tight with a hammer; but this is considerable work, and they are hard to remove when badly stuck up with bee-glue. Thumb-screws are better, and always right in place when wanted. When I got mine I put them into a keg of linseed oil to soak. This greatly injured them. It caused the threads to check and crumble off somewhat. I have since learned that, if I had put them into hot tallow instead of oil, it would have been a good thing for them.

TALL SECTIONS.

I notice that you seem to be in favor of changing the standard of size in sections for one tall and narrower. It would cost a good many—at least it would cost me—a good deal of money to change or fit all my supers for another size of section; and at the present low price of honey for even the very finest grades, I think it would be a good while indeed before I could get enough more from the sale of honey in tall sections than I would from that in standard-sized ones to pay me for making the change. But will honey in tall narrow sections sell more readily? Last fall I was in St. Paul and Minneapolis, where I sold about 2000 lbs. of honey in standard-sized sections. One day in Minneapolis I was in a large retail store, where I sold a large amount. They had some tall narrow sections that held about a pound. A man came in and wanted a few pounds. He was offered some in these tall sections. He refused them, and said there was too much comb and too little honey in them to suit him, and that he wanted no more of them. He took some in square sections which I had just sold them, and said there was more real honey in one of them than there was in two of the others. Of course, his was an extreme view of the case; but will the general public be fooled into believing that there is more honey in tall thin sections than there is in others of the same weight that are square and wider?

A person who seldom buys honey, or one buying a section for the first time, might do so; but regular buyers or users would not long think so.

Tall sections filled would, I believe, be much harder to handle without injury. It would require more foundation to fill them, and on this account they would be more apt to have fish-bone in the honey. It is claimed that bees will fill and cap these tall thin sections quicker than they will square ones. I have never used them, but I have strong doubts of this. If a swarm is hived in a shallow brood-nest containing less space than the regular eight-frame hive they may enter the supers sooner, and do more section work in any kind of sections during a short flow; but in that case the colony will be, and can not help being, "if there is only one flow," short in stores and bees for winter. On the other hand, if the flow is long they will not do as much section work; for, not having enough brood room, they decrease in strength before the flow is over. I am now speaking from much experience in this matter; and while shallow or double brood-chamber

hives, especially in localities where there is a fall flow of honey that will answer for winter stores, can be very profitably used under the right management. I do not believe tall sections have much to do toward their success. If grocers want sections of lighter weight than 1⅞ wide gives, narrower ones can be used. Supers will not then have to be changed, and we shall preserve the standard square; but I believe it would be folly for us to try to suit grocers and dealers in all respects, for some of them would always want some changes made, which might be a large expense to the producers; and at the present prices of our product we (or at least many of us) are not able to stand any unnecessary expense.

Southern Minn., Jan. 2.

[If the wide separators run clear down between the pat n-slats, then the objection that I urged would not hold. Such an arrangement wou d be perfectly practicable. Thumb-screws may be a little better for producing compression. The advant ɛe of the wedge is that it is inside of the hive, and out of the way, while the thumb-screws stick out beyond the sides of the super.—Ed.

SQUARE VERSUS OBLONG SECTIONS.

COMBS NOT ATTACHED TO THE SEPARATORS.

By G. C. Greiner.

Ever since the one-piece sections have come into general use I have had an opportunity to make observations in regard to their practicability. The usual 4¼x4¼-inch section did not fit the hive I used. To accommodate my surplus-appliances, a section 4⅛x5x1¾ inches was necessary and desirable. First, it held as nearly a pound as sections can average; and, second, I greatly preferred the oblong shape. After these many years of practical experience the result is so different from Mr. Salisbury's experience, as set forth on page 17, that I am of the opinion the objections raised by that gentleman are in a great measure imaginary—not that I have the least doubt as to the correctness of his statement in regard to combs being fastened to the separators, but that there is another factor at the bottom of his trouble besides the oblong shape of his sections.

The difference between the width and height of the 4¼-in. square and his nearly 4x5 in. sections is so trivial that it seems almost impossible that bees would attach the one and not the other. Nature directs bees to build their combs plumb; and, guided by this impulse, they do their work in a way that will accomplish this object. In examining sections in their various stages of progress we invariably find them on both sides alike, drawn out and filled, or so nearly alike that a swinging one way or the other, by greater weight on one side, could not be caused. The only difference we always notice is in capping. The outside combs are on the outside, more or less behind the inside; but the weight of the cappings is of so little amount that, by this slight variation of weight, a comb would not be forced out of its perpendicular sufficiently to strike the separator and be attached.

As I have never used the 4¼x4¼-in. section I can not say how much better my bees would have done along this line of not attaching to the separators; but I can say that, in all of my experience in producing honey in oblong shape, I have not had enough sections made unmerchantable, by being attached, to fill a 24-lb. shipping-crate.

BUCKWHEAT SEASON.

The past summer can be recorded as one of the occasional exceptions—a season without buckwheat honey. When the buckwheat had reached its honey-producing stage, bees started in in good earnest, and bid fair to gather an abundant crop; but after a few days' work the cold wave struck us and blasted our hopes. Most of the time it was so cold that bees did not leave their hives, even in the middle of the day; and when warmer weather returned, buckwheat was so near its close that bees did not resume work in sections; consequently many unfinished sections were left on the hives. I have about 1000 drawn-out sections, many of them full-sized, perfect combs, all cleaned out by the bees, and stored away for next season. What seemed to be a loss last fall may prove a blessing in disguise in the shape of an increased honey crop next year.

Naples, N. Y.

TALL SECTIONS PREFERRED; NO TROUBLE WITH COMB BUILT TO SEPARATORS.

In Gleanings for Jan. 1, p. 17, Mr. F. A. Salisbury seems to have trouble by getting comb fastened to separators by the bees in drawing out the foundation. I have been using both the square and oblong section, and I find no more tall sections fastened to separators than square ones. I have used the Danzenbaker section, 3⅞ x 5 x 1¾, for two seasons, and I prefer them for more reasons than one. First, there is a better market for them, and that is one of the best reasons, as I make it to sell; and, again, I think the bees will enter a deep super sooner than a shallow. I think if Mr. Salisbury will use 1½-inch starters in his sections, put them in with a Daisy foundation-fastener and set his hives level, he will have no trouble with his tall sections.

S. D. Matthews.

Hamilton, N. C., Jan. 12.

TALL SECTIONS BEST; NO TROUBLE FROM COMB BEING BUILT TO SEPARATORS.

In Gleanings for Jan. 1, Mr. F. A. Salisbury raises an objection to tall sections because the bees fasten the comb to the separators more than they do in the 4¼x4¼ sections. I have been using a section 4x5 for a number of years, alongside the 4¼ section, and I have not discov-

ered any perceptible difference in regard to the bees fastening the comb to the separator of the tall section more than to the 4¼ section. I am like Mr. Doolittle—I think they are more symmetrical in appearance; and I have found that, where the two sections have been brought into competition with each other, the tall section sells first. In our market here I do not know that they bring any more; but I know that the tall section is the more easily disposed of; and the fact that more of them will stand over a given space is a point in their favor.

Delhi, Ill., Jan. 23. H. D. EDWARDS.

MR. DANZENBAKER N THE TALL SECTION.

My attention has been called to Mr. Salisbury's objection to ta l sections on page 17 in GLEANINGS. The veteran Doolittle, who is always right, has more than answered him in the next column. take exceptions to his idea that it is the bees that twist his foundation out of line. I had a like trouble with some 1⅞-in. sections that would not stay square. They would spring or draw out of square, and bind the foundation and cause it to wind out of line. I overcame that entirely by seeing that the sections were folded true, and kept so by wedging them in the super before and after the foundation was put in. I also set the foundation so that, if the section was out of plumb, it would not press against the foundation when the section was squared up.

Washington, D. C. F. DANZENBAKER.

TALL SECTIONS NO ADVANTAGE OVER THE SQUARE.

Referring to tall sections I will say that for ten years I used a section 5¼ high and 3½x1⅞, which holds about the same as the 4¼x1⅞; but they cost me from 50 cts. to $1.00 more per 1000, and had to be made to order. I was sometimes troubled to get them in time, so I am now using the 4¼ section. I don't think my honey in the tall sections sold for a larger price than honey in square sections; at any rate, I never got a large price for it, and commission men who have sold it never told me it sold quicker. I was not troubled much by having foundation fastened to separators if hives were kept level.

W. J. AUSTIN.

Chittenango, N. Y., Jan. 12, 1897.

IN FAVOR OF THE TALL SECTION; A PRACTICAL SCHEME FOR USING THEM IN THE REGULAR DOVETAILED SUPER.

I see in a footnote you want opinions as to what kind of sections bee-keepers would rather use. I for one would rather use a tall section that would weigh just 1 lb. as nearly as possible, and I have thought of a way in which the tall section might be used on the eight-frame hive; but I have not tried it, and it might not work as well as I think. My arrangement is something like this: Instead of there being a rim on top of the super, have the rim on the bottom (not nailed fast); then to this rim nail the bottom-bars of the section-holders, the bottom-bars to be an inch longer than they are now; a groove cut out of the rim on the bottom side to admit the bottom-bars, and have them nailed fast to rim; then use two followers and wedges the size the section ought to be. I haven't figured out, but it ought to be so as to give more elbow-room in the super. The two wedges ought to be square pieces at least ¾ of an inch square. This would give a chance to take a section out as soon as finished before it is travel-stained. WM. KERNAN.

Ringdale, Pa., Jan. 7.

[Your scheme is perfectly practicable, and we can adapt supers in that way if so desired. Later on we may show a cut of the plan. As the standard tall sections are 4x5 inches they can be used crosswise of the regular 8 frame super (which is 12⅛ in. wide) without any waste space to fill up. Of course, the hive should be perfectly level in that case.

It would seem, from the letters above, that there is no very great danger from combs sticking to the separators. I doubt not that there will be many who will want to try a few of these tall sections on their dovetailed hives, and yet feel that they can not afford to buy new supers. To accommodate all such we have arranged to supply a rim deep enough and large enough, when put on the bottom of a regular 8-frame section-super, to take in 4x5 sections with supporting-slats.—ED.]

PRODUCTION OF COMB HONEY.

By Adrian Getaz..

This article is written exclusively from a comb-honey producer's standpoint; and if some of the assertions made seem exclusive, it must be remembered that they apply only to the conditions peculiar to comb-honey producing. If there were no swarming, the management would be the simplest thing in the world. Just put on enough sections at the right time, and take them away when they are full. That would be all. But with the swarming, the difficulty begins; so, after all, the comb honey-producing question resolves itself practically into a swarming-management question.

NORTHERN MANAGEMENT.

What I mean by this is the management adopted and advised by all or nearly all our leading writers, and suited to what I may call the Northern States, including Canada, the Eastern States, and the Central Northern States, such as Ohio, Illinois, etc. The characteristics of the honey-flow of that region are: A moderate flow from the winter until the main honey-flow, just enough to get the colonies in good shape; then follows a heavy flow of only a few weeks' duration, the swarming taking place just at the beginning of it.

Two methods of management have been successfully practiced under these circumstances. The first consists in hiving the swarm on the

old stand, and having as many as possible of the bees there; and, by contracting the brood-nest, compel the bees to store most of the honey in the sections. The second consists in removing or caging the queens at the beginning of the main flow, and not returning them until three weeks later. The queen-cells raised during that time are to be destroyed.

SOUTHERN HONEY FLOW.

There is a fundamental difference between the northern and the southern region as to the character of the honey-flow. In the northern region, as described above, the swarming is followed by only a few weeks (six weeks at most) of comparatively heavy flow. Here, and in all the South, we have, after the swarming, a period of from two to three or even four months of moderate and very irregular flow; that is, not a continuous flow; and what makes it more difficult is that we can not tell in advance which sources of honey are going to yield and which ones will not; so it is necessary to keep the colonies as strong as possible during the whole period. This necessitates prevention of swarming, or, at least. of increase, and also the least loss of brood possible.

And what I say here of the South applies more or less to the Northwestern States where the surplus comes from alfalfa and sweet clover, and to the Pacific Coast.

TWO PRACTICAL CONDITIONS.

Many processes of preventing swarming have been successfully practiced, but yet can not be advised under the circumstances now considered. The first condition is, as already stated, the least possible loss of brood. The second is the least possible work for the apiarist. This throws aside all the processes requiring to do certain things when the colonies are in a certain condition; for instance, when they are beginning to build queen-cells. The reason is obvious. To know when a colony has reached the proper point would require at least two inspections every week. Think of the work in an apiary of 300 colonies, besides the aggregated loss of brood and honey caused by the disturbance! What is to be done must be done in a wholesale way, at a definite time, say, for instance, at a certain time of the year, or when the swarming takes place.

After some seven or eight years of experimentation with all sorts of methods and apparatus, I recommend the two following processes.

FIRST PROCESS.

Discourage swarming by all possible means. Have the brood-nest of sufficient size; put on the supers in due time; use all the drawn comb you can; don't keep any queen over two years old, etc.

A point here needs insisting upon. The first super ought to be given early enough to prevent crowding in the brood-nest. On the other hand, the excess of room given tends to lower the temperature of the hive and frequently prevents the working of the bees in the super—at least the building of comb, especially during the night. A good deal has been written concerning the necessity of protecting the brood during the early spring, but nothing or next to nothing concerning the necessity of keeping the first sections given sufficiently warm, during the first part of the season. Yet I consider the last point as important as the first; and I do not hesitate to say that, in most cases, when the bees do not enter the supers readily, it is because they are unable to keep them warm enough to work these successfully. Notwithstanding, a certain number of colonies will swarm. Return the swarm and remove the old queen at once. Take out all the queen-cells but one, and allow the colony to requeen. This does not cost any thing; the cells are there, the young queen is, as a rule, preferable to the old one, and the time without a laying queen is reduced to a minimum. A queen caged or removed can not be returned before 15 or 20 days or she would swarm again; and even then a certain number would reswarm. Raising queens in advance would necessitate the making of nuclei, and the draft of bees and brood from the colonies to make the nuclei would damage them more than the loss of brood by the above process. Use the removed cells to replace as many of the oldest queens possible, or those otherwise objectionable, thus reducing the number of colonies liable to swarm. It is needless to say that the use of queen-traps will reduce the above work to a minimum.

SECOND PROCESS.

Where bee-paralysis exists I prefer to requeen the apiary throughout, though I have not always had the time to do it. Requeening in the very early spring is objectionable. In the first place it is not absolutely certain that it would prevent swarming in all cases. Buying queens in Florida costs something. Raising queens very early entails a considerable loss of brood and bees to the colonies, and one bee at that time of the year is worth ten in the middle of the summer. The raising of queens by the nucleus process takes too much work anyhow when one wants only queens for his own use. I prefer to wait until the time, or near the time, of swarming. If a few colonies swarm before I am ready I treat them as stated in the preceding paragraph. To reduce the loss of brood to a minimum I unqueen at first only one colony out of six or seven, perhaps eight, and I use their cells to requeen the others, removing the queens only when putting in the cells. I wait as long as possible to do the final requeening, partly to reduce the loss of brood, partly because the cells not well advanced are not always accepted. It seems that

an immature cell is to the bees nothing but a lump of strange wax, which they proceed to tear down, while an advanced one has already the scent of a queen, and is accepted as such.

Some precaution is to be taken in putting them in. Sometimes the bees spoil them in trying to fasten them to the combs. Perhaps the best would be to use some kind of cell-protectors. To facilitate the operations, entrance-guards ought to be used so as to prevent the loss of a swarm in case some queens happened to emerge before the time anticipated. It is well to see that queen-cells be not started between the time the cell is put in until the young queen emerges, or, rather, to destroy them. None will be begun after she is out, or, at least, very seldom.

INFLUENCE OF BEE-PARALYSIS.

As I have often stated, bee-paralysis exists here, and is a serious drawback to the apiarist. The malady damages in several ways. First, by reason of less activity in the bees, which, as the malady advances, become more and more paralyzed; secondly, shortening of their life; and, thirdly, a failure in the laying powers of the queens. This takes place during the second year of their life, or even sooner. In such cases they are generally superseded; and with the superseding, swarming takes place. The result is a great excess of swarming besides some loss of brood during that time as a result of the failure of the queen. Very often queens disappear entirely without any apparent cause.

Occasionally the bees fail to requeen, either because the colony is too small or because the sick bees lack the necessary activity. In that time, and under such circumstances, the colony enter into what some writers have called the second stage of the disease. One of its characteristics is that very young bees, even just emerged, show already the symptons of the disease.

The only way I can account for it is that, when the queen has reached that degree of sickness, her eggs contain already the germs of the disease. This supposition is not improbable. The disease of the silkworm is produced by a bacillus almost identical to the one producing bee-paralysis; and in the silkworm the disease is transmitted from one generation to the next, through the eggs of the female moth.

Any careful reader of the bee-papers may have noticed that, while our leading writers do not think that bee-paralysis is such a terrible thing, reports come now and then from honey-producers of disastrous results. This corroborates the above supposition. Most of our leading writers are queen-breeders, and renew their queens all the time, which results in vigorous and healthy queens, or, rather, queens that may barely have the germ of the disease, while the honey-producers leave the requeening to the care of the bees, resulting in queens reaching the age of two or three years, occasionally more. My own experience is the same. By frequent requeenings, I find that I can keep the disease within comparatively narrow limits, but not cure it completely, showing that other ways of contamination exist also.

CONSTRUCTION OF QUEEN-CELLS.

From ages past until now it has been admitted that, when the bees were too crowded, they decided to swarm, and constructed queen-cells to save the old colony from being left queenless. That last part of the program is a mere supposition. I doubt whether the swarming bees care a snap what becomes of the old colony.

Some four years ago I acquired, during my experiments, an entirely different opinion on the subject—an opinion that the following years have fully confirmed. The construction of queen-cells is due to an excess of larval food. It takes place when three conditions exist: 1. A honey-flow which furnishes the materials; 2. A considerable number of young bees acting as nurses, and preparing the food; 3. A diminution of the brood to be fed, that is, not enough to consume all the food prepared.

The diminution of brood to be fed may be caused either by the lack of empty comb to receive the eggs or by the failure of the queen to lay enough. A young vigorous queen will lay all the eggs (if she has room enough) that her colony can take care of. That is the reason why, unless decidedly cramped for space, a queen of the year's rearing will seldom swarm, or, to put it properly, her colony will not often construct queen-cells.

CONFLICT BETWEEN QUEEN AND QUEEN-CELLS.

By the time the queen-cells are sealed, or soon after the old queen realizes (probably because the sealed queens begin to have the queen's peculiar odor) that she has rivals, she attempts to destroy them; but the bees instinctively prevent her from doing so. The excitement keeps growing worse and worse, and finally culminates in swarming. If two or more queens are in her presence a fight ensues, and only one is left; but when one queen can not destroy these contained in the queen-cells, she is sure to swarm, or, rather, the racket she raises induces swarming, and the whole outfit goes out together. A caged queen placed in a colony has the same effect as a queen-cell, as I found out by an involuntary experience myself. Some German writer has advised that very process in order to compel a colony to swarm.

If the cells are where the queen can not be aware of their presence, in an upper story, for instance, no swarming will take place, showing conclusively that the jealousy of the queen against the cells is the cause of the swarming.

Knoxville, Tenn.

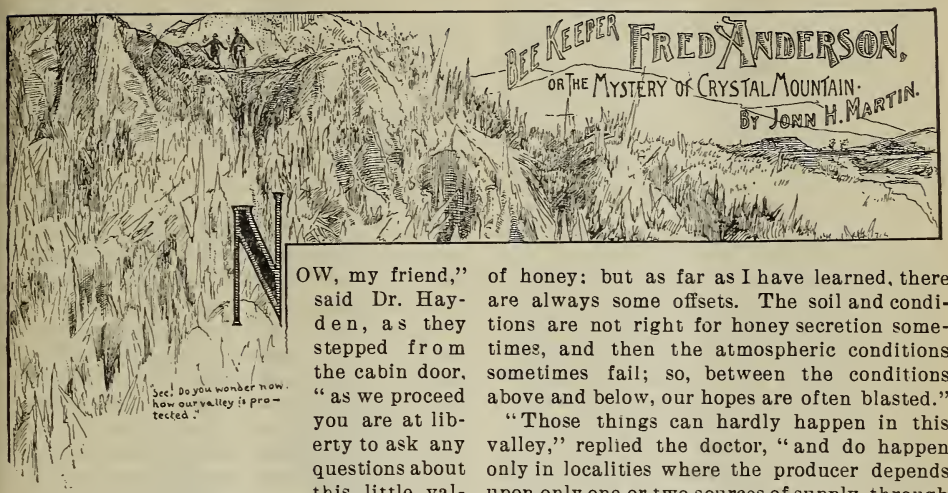
HOW TO BUILD UP A REPUTATION.

Question.—Is it any advantage to put your name and address on cases of honey which are to be shipped on commission to commission men? If so, what?

Answer.—Each year, from 1871 to 1877, I sold my honey to a dealer in Syracuse, N. Y., delivering it there by wagon, so that it always arrived in first-class condition. As the merchant always took all the honey I had, both extracted and comb, together with all the dark honey, I considered it a good thing for me, and would still think so if I could thus sell my honey now; but death removed him in the early part of '78; and although I have several times tried to have other parties in this city take his place, yet not one was willing to do so, as regards buying and selling honey. However, there was one thing I did not quite like, which was that he insisted on my bringing the honey to him in cases having nothing on them except the gross weight, the tare, or weight of the crate, and the net weight of the honey. When I asked him the reason for this he showed me stencil-plates bearing his own name and address, and said, "I put my name and address on every case of *really fine* honey which I buy, so as to build up a trade in honey, thus securing a name second to none; for with all inferior honey I leave this stencil-mark off, so that none but the very best bears my name, and thus I am gaining a reputation year by year which is growing constantly to my benefit. If I allowed you to put your name on the cases it would not help me a bit; and as long as you sell to me each year it could be of no benefit to you." After a year or two I saw that his line of reasoning was correct; for every year gave him a larger range of customers, until, at the time of his death, he handled honey by tons to where he handled it by the ten pounds when he began. After his death I began shipping honey on commission, and wrote my commission merchants, asking them if they would allow me to put my name and address on each case. To this they objected; but a few said they had no objection to my putting my name on the sections inside the case if I wished to do so. I accordingly procured a rubber stamp with the words "From G. M. Doolittle, Borodino, N. Y.," on it, as well as a dating-apparatus which would remain good for ten years. I could now, in a moment, put my name and address on any thing I wished, from a postal card up to a bee-hive, and give the date of so putting on, if desired. Outside of the first object, as originally intended, I have found this stamp of great benefit to me in many ways, and I would advise everybody who reads this to procure such a stamp and see how much in time, money, and temper it will save them. I believe The A. I. Root Co. can furnish such stamps to any who may desire. To return:

Taking the hint given me by the honey-merchant, I put my name on only all really nice honey, and let all "off grades" go without it. And right here I wish to throw in a suggestion. We have heard much in the past from commission men and others about some sending them honey, putting all sorts of inferior honey into the same case with fancy honey, putting the fancy on the outside, and the inferior in the middle of the case where it would not be seen till the case should be opened. I never blamed commission men for being out of patience with those who would work against the interests of every one concerned, enough to do this thing; and the suggestion I would make is this: If you will procure a rubber stamp, and use it as did the honey-merchant spoken of above, no one will ever have a chance to say aught but words of praise for the even appearance of all honey which you put in any case. To return again:

After the sections were all in the shipping-case, and before the cover was put on, it took only a moment or two of time to stamp all the sections in that case, thus letting the consumer know by whom such fine honey was produced, while the commission merchant received all the credit with the retailer, unless, perchance, such retailer desired to deal direct with the producer. And thus it came about that I got many letters from different parts of the country reading something like this: "I purchased of Mr. So and So a splendid article of honey bearing your address. As it gives the best of satisfaction, for how much could you send me —— cases of such honey?" And so it has often come about, that, after my honey was all disposed of, I would have many calls for honey which I could not supply, but which gave me a "leverage" for the next year. So it will be seen that the plan of a shrewd merchant has not been lost, even if he did keep me where he wished while he was living. Why I said in the fore part of this article that I should be glad to sell as I formerly did was that there is an advantage in selling the whole crop to one person, for cash on delivery, not gotten by selling the crop out in small lots, or by shipping it on commission. All will think of some of these advantages, without my enumerating them. However, it so happens that the most of the large producers can not sell to one party each year, and for this reason I give the above plan, as I believe it to be a good one, and just the one to work upon when we can not sell our whole crop to one person, or all of it in our home market. And by this plan many are induced to eat honey who do not generally buy by the advertising done by those who are pleased by a really nice article of honey. It takes all of these little kinks as going toward a whole to make successful bee culture.



NOW, my friend," said Dr. Hayden, as they stepped from the cabin door, "as we proceed you are at liberty to ask any questions about this little valley that the surroundings may suggest."

"Well, doctor, you know the old adage, 'Give a Yankee the conversational pump-handle, and he will pump you dry;' and if my seeking for knowledge depends upon my questioning ability, then I will commence by asking you, what is the length and breadth of this valley?"

"A very proper question," said the doctor, "and a very natural one from a bee-keeper who is looking for a profitable location. This valley is two miles in length, with an average width of half a mile."

"And you have an apiary here, and propose to largely increase. Now, don't you find one square mile too little space for profitable bee culture, or do the bees find pasturage on the mountains beyond?"

"There is no flora on the summits beyond. This one square mile contains flora enough for a very large apiary."

"Why, doctor, if you can succeed with so many bees in such small area you are indeed progressive. The best locations I ever knew were considered crowded had they twenty to the square mile, and even then only one season in five would produce a full honey crop."

"That is so, Fred, where the producer depends wholly upon natural pasturage; but living as I am in this valley, with the unlimited privilege to do as I please with my surroundings, I have planted only such vegetation as will produce honey in the greatest abundance, and the results are astonishing. Now, instead of figuring how many colonies a square mile will sustain profitably I figure from the other end of the problem, and am trying to find out how many square *feet* will sustain a colony."

"I can readily understand," said Fred, "that a constant succession of honey flora, nearly all the year round, would give an immense amount of honey: but as far as I have learned, there are always some offsets. The soil and conditions are not right for honey secretion sometimes, and then the atmospheric conditions sometimes fail; so, between the conditions above and below, our hopes are often blasted."

"Those things can hardly happen in this valley," replied the doctor, "and do happen only in localities where the producer depends upon only one or two sources of supply, through limited periods and under fluctuating climatic conditions."

"But, doctor, although you live in a valley in these remote mountains you are surely subject to changes."

"Yes, we are subject to changes, but we have the means to counteract them to a certain extent, as I will show you as we make the rounds of the valley."

This conversation was interrupted by the appearance of Sam, with a couple of donkeys saddled for the trip.

"Why, doctor, I had about as lief walk, as to ride one of these little ellows. I could almost carry this one on my back. By the way, is this all of the horse kind you have in the valley?"

"Oh, no! we have a young team, but it takes some time to grow a team here; the passage through which we enter the valley will barely let in those donkeys; and if we want horses we must bring them in as colts and let them grow. Just the same with our few Jerseys. They came in as calves; and if they go out it is by the quarter."

"And the rattlesnake chamber?" queried Fred.

"We have an easy way to manage that," replied the doctor, "and will show you some time. Now, the first stage in our journey will be to follow up these terraces. Hey, Sam!" shouted the doctor, "take down a little lunch about noon to the apiary."

"Ki, yi, doctor! I'll be dar under de yoak, dis side de yapery. Don't ketch me gettin' my woolly head near dem bees, suah."

Up the first terrace Fred stopped his donkey, and said, "What a profusion of little flowers are spangled over this mosslike vine that is clinging to these rocks! and how busy the bees are upon them!"

"Yes, that is one of our valuable honey-plants. Out in the great world you find that

only in flower-pots, or to make mosslike banks in public parks. It is mesembryanthemum, and produces an abundance of fine-flavored white honey. I am getting it well started here; you can see the possibilities for the plant in this valley. Give it a good rooting-place, and it will hang over these rocky surfaces; and the beauty of it is, that it covers the portion of the valley that stands up edgewise. This," said the doctor, as they mounted another terrace, "is my shrubbery terrace, such as veronica, heliotrope, etc. These shrubs bloom almost continually in this valley; and, see how industriously the bees work upon them. Then in the lower part of the valley I have the sugar-gums in their variety. Yonder is a terrace devoted to the sages, while on the level portions I have alfalfa and other plants. If we sow merely low-growing plants we can not go beyond our ground acreage; but he who plants a tree puts the acreage in the air; and with the growth of the tree the acreage is permanently increased every year."

"I have often thought of that," said Fred, "while watching year by year the growth of our basswood trees in the East; what an immense acreage of bloom was carried high in the air! But the average bee-man is looking to immediate returns, and thinks it a waste of time to plant for the future; but the fact remains that the noble tree makes the permanent pasturage."

"Yes, Fred, and I am thoroughly of the belief that, if people were dependent upon the bee-hive for their sweets, the production of honey would have been enlarged; the growing and development of honey-producing flora would have been pursued upon scientific principles until production would keep pace with the demand. But cane sugar relegated honey and the prospective development to the background."

"Well, doctor, that is something I had scarcely thought of; still, such development of honey flora may be possible. You said a moment ago that you now study honey production from square feet instead of square miles. Have your experiments in that line led you to determine the number of square feet that would sustain profitably one colony of bees?"

"Approximately I have proved near enough to satisfy myself; and, to speak in round numbers, one colony could find support and give a good surplus of, say, 300 lbs. on 1000 square feet of territory, or ten colonies to the acre; or 5000, say, to the square mile."

"Let's see," said Fred. "A thousand square feet would be about four square rods. Whew! that statement would sound Quixotic to every bee-keeper in Christendom. This valley must be more wonderful than any thing of which bee-men have ever dreamed. Just imagine 5000 colonies of bees in this little valley!"

"I know," said the doctor, "that this valley can be made to produce more than any other place, and it will take several years to get this up to its best; but it must be evident to you that any favorable location under an intelligent planting of trees, shrubs, vines, and plants, could, in a series of years, be brought up to a high state of production."

"Doctor, I must acknowledge that to be a fact. Why! bee-keepers, as a rule, have scarcely ever tried to increase their pasturage beyond what nature gives them; and the honey-flora of the world has not been one hundredth part exploited."

"Furthermore," said the doctor, "instead of hunting new races of bees I would hunt honey-producing flora and adapt it to our country. There is a world of study and experiment awaiting somebody in this field."

They had now reached the upper terrace, and beyond it there was a natural formation that attracted Fred's attention, and he halted his burro, and exclaimed, "Why, doctor, what a terrible-looking place that is! it looks like an acre of glass butcher knives and cleavers, all points and edges up. Why! a man couldn't walk in there five feet without cutting his feet all to pieces; and if he should fall down he'd be a dead man, sure. Ugh!" said Fred, with a shudder.

"Certainly, Fred, that is a bad piece of nature; and now while I think of it I'll show you some more like it;" and, alighting from their burros, they climbed a niche in the side of the cliff, and at the top they stood upon a little cleared place.

"Now what do you see?" asked the doctor, turning to Fred.

"This is truly wonderful," exclaimed Fred, as his eyes followed the circle of the valley and beyond. "The surface of this whole mountain outside of the valley is butcher-knives and cleavers; and now at least one mystery about this valley is solved; that is why no one ever attempts to cross the mountain."

"That is precisely so, Fred; and, furthermore, no one has a suspicion that a beautiful valley lies beyond such a terrible surface."

"Then from the appearance of things I should think this whole region is of volcanic origin."

"It certainly is, and I believe that this valley was a volcanic crater years ago; there are even now occasional rumblings, and there are boiling hot sulphur springs in the center of it; but it is now lunch time, and we will hasten to the oak-trees. Sam has not arrived," said the doctor, as they approached the trees; "but he will be here in a few minutes. Let the donkeys graze. Stretch yourself upon this mossy bank, and rest. We would take our lunch at the apiary; but Sam is an arrant coward when near the bees. Hello, Sam! I guess you heard my compliments to you."

"Dat's so, sah, an' dat's so about my gettin' my woolly head neah de bees. Somehow dey don't like de kinks in my har."

"Why, Sam," said Fred, "you must have a holy terror of the busy bee. I believe I could teach you to handle them."

"Don't mention it, Mister Fred. Don't you nebber mention it. De bee am de enemy ob de

whole African race. If dar'd been no bee dar'd a been no brack men, suah."

"Why, Sam, how in time do you make that out?" said Fred, with no little curiosity.

"It mus' be you nebber heard our family stradition."

"No," replied Fred. "I never did. Your tradition certainly charges the little bee with a mighty transaction."

"You see, Mister Fred, our African family stradition hab it dat dar was Mister Noah, Mistuss Noah, Ham, Shem, and Japeth. Dey all stood aroun de doah ob de yark, a beholdin' de animals goin' in, an' dey was all white sons ob Mister Noah—Ham, Shem, an' Japeth. It must a ben a spirin' scene to see de elephant, de lions, de giraffs, de 'possums, an' de lesser animals, all two by two, a goin' in like one paneramy, an' dey didn't haft to buy any tickets to see de show. Just as all de small creeters was a goin' in, dar jus came a hummin' down a hul swarm o' bees, an' dey jus' lit on Mistuss Noah's close-line post. Mistuss Noah said she didn't believe dey wanted so many, an' was goin' to save jus' two bees and scald de rest. But Mister Noah told her to desist, an' she desisted; den he told Ham to put all de bees in a big gourd, an' put dem in de yattick ob de yark. Ham had seen so many fierce beasts a goin' into de yark dat he was full ob self-confidence when he 'proached de little bee, an' he 'fused to put on his ma's brussels-net veil. Worse still, he brushed dem off de post wid an ole stub brush-broom, consequently de bees took a han' in de business, an' stung Ham all over his face an' his head an' his arms, an' he was a dreffal sight. When de boys, Shem an' Japeth, got him into de tent he went right into convulsions. De hul family was 'cited 'cept Mister Noah. He shook Mistuss Noah. Says he, 'See he'ah, woman; you jus' stop dat snivilin' an' git a bottle o' wine—some o' dat ol' Canaan wine—quick, too, an' let Ham drink a hul bottle of it. Dat good ol' wine'll contract de sting pizen ebery time.' De Noah family had jus' broke up housekeepin' agin a takin' de navigation ob de yark, an' things was sort o' mixed up in de tent. Mistuss Noah was greatly flusterbated, but she found a bottle, an' Ham's convulsions collapsed long enough fo' him to drink de contents. I 'spect he hear'd 'em say it was good ol' Canaan wine. It had a good effec', howsumebber, for putty soon he sot up, an', says he, 'Ma, what in de dickens was in dat ar' bottle? Now it am down, it don't tas' good. It don't tas' like dat good Canaan wine; it tas' orful bitter;' an' Ham hawked an' spit.

"Mistuss Noah took de bottle an' smelt it, an' says she, 'I dunno;' an' she handed it to Shem, an' he smelt it, an' says he, 'I dunno;' an' Shem handed it to Japeth, an' he smelt, an' he said, 'I dunno;' an' Ham says, 'Pa, do smell ob dat ar bottle.' Noah left off readin' de daily paper, and took a long smell 'Lan' sakes alive!' says he; 'woman, you gub Ham dat ar' bottle o' brack ink, specially pared from goats' galls, for scribin' de flood.' But in spite ob dat, Ham began to 'prove, an' to turn brack all over. Says Mistuss Noah, one mornin', 'Dat ink seems to be a strikin' in.' 'Nay,' says Mister Noah, 'it am a strikin' out;' an' poor Ham kep' a growin' better'n better, an' bracker'n bracker; an' bein' dat de ink struck in an' struck out at de same time, an' den struck wid de bee-pizen, he nebber got over it—no, nebber, an' unnumbered generations ob his children are brack to dis day, an' dey all hate de bee."

"Well, Sam," said Fred, "that is a most remarkable tradition; but what became of the bees?"

"De stradition don't say; but I 'spec' Mister

Noah see to it dat 'nough bees got into de yark for seed."

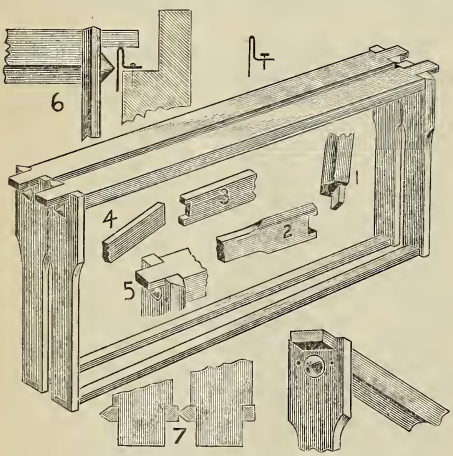
IMPROVEMENTS ON BEE-HIVES AND APPLIANCES TURNED OUT AT THE HOME OF THE HONEY-BEES FOR 1897.

Our policy has all along been to keep fully up with the times, and generally a little *ahead* of them. We point with pride to some of the innovations that we have introduced in the years gone by. For instance, dovetailing the hive-corners; self-spacing frames; Cowan extractors; new process of comb-foundation making, besides a long list of minor features, all of which have come to stay, and on not one of which have we had to take a "back track." Before introducing them we have taken a deal of pains to investigate and test thoroughly, and the result is that I believe our bee-keeping friends have come to look upon us as rather the leaders in apicultural progress.

During the last two or three years we have made no very great changes; but during this year, 1897, we shall announce in our catalog some improvements in hives and appliances that we feel very sure will be accepted at once. Our new 1897 list will be out, probably, within ten days. It will contain cuts and descriptions of the new features. Among the first is the

NEW 1897 HOFFMAN FRAME.

When we first introduced this frame, some years ago, it took like hot cakes, and the continued and increasing demand for it ever since shows plainly enough that it is a practical labor-saver. It had, however, just one fault; namely, that the bees would stick the ends of the top-bars to the contiguous parts of the hive-rabbet, so that, in order to remove one frame, it sometimes became necessary at some seasons of the year to break this top-bar propolis con-

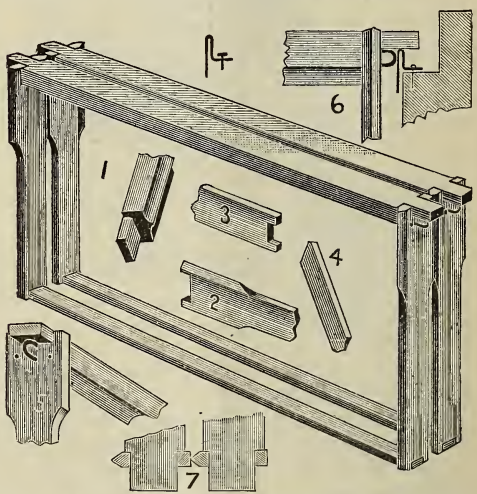


CALLBREATH'S END-SPACER.

nection of several other frames before the frame in question could be removed. We have been studying on this problem for a couple of years. We have recognized the fact that a bee-space *around* the ends of the top-bars would solve the trouble. The next difficulty was, how to prevent end play. We had thought of a number of devices, and finally Mr. John S. Callbreath, of Mongaup, N. Y., sent us a frame with furniture-nails under the top-bar, as shown in the accompanying engraving.

I must confess I was at first delighted with the idea. During the summer we tested several hives with these end-spacers on the frames; and to say that I was pleased with them after manipulation was putting it mildly. During the very worst part of the propolis season, and even when it turned cooler, so that the bee-glue would snap, I could handle Hoffman frames with these end-spacers, with my fingers alone. Such a thing as a screwdriver or a pry was unnecessary. The reason will be apparent. The metallic head of the furniture-nail striking against the tin rabbet would offer the bees no chance to propolize; and even if they did attempt to stick it, the points of contact were so small that it practically amounted to nothing. You can set it down as a rule that bees will never attempt to daub up with propolis a point of metal when it comes against a flat surface of metal.

But we met one serious difficulty—the cost. After a good deal of inquiry we were forced to the conclusion that we could not get these furniture-nails cheap enough without tucking on another dollar or two per 1000 to the cost of the frames. Then our thoughts turned to nails, staples, strips of sheet metal, iron buttons, and every thing else in fact. The staples seemed to be the most feasible. But the question was, to devise some simple and cheap way so they would be driven just so far and no further. That problem, Mr. E. B. Weed, of foundation fame, solved for us very nicely, and which I will refer to further on. Well, here is a set of Hoffman frames with staple end-spacers:



THE NEW 1897 HOFFMAN FRAME WITH STAPLE END SPACERS.

These staples, providing they are driven the right depth, are as good as furniture-nails, and cost only one-fifteenth as much. The expense is so trifling that we have decided to put them on all of our 1897 frames, without additional cost. Of course, it will be understood that top-bars on all such frames will be a bee-space shorter at each end, making them ⅛ inch shorter than the last year's top-bars. The staples are fully as strong, and present as little surface of contact as the furniture-nails; and by the method which I will now describe they can be driven to an exact depth, without any variation.

The engravings below will make the matter so plain that it will hardly be necessary to give the method. In Fig. 6, A shows the gauge, the thickness of which is just equal to the height of the staple in the end-bar after it is driven in. The gauge A is pushed up against the under side of the projection of the top-bar, as at Fig. 1, and the staple dropped into the slot. It is then driven down as in Fig. 2, as far as it will go. The gauge is pulled away, leaving the staple at exactly the right depth, as at Fig. 3 In this connection it might be well to state as shown in the figure, that the projection is exactly ⅛ inch, leaving it exactly ¼ inch from the end of the staple to the end of the top bar. Fig. 5 shows a cross-section of the end of the hive and the frame. It will be observed that the bees can go clear around the end of the top-bar.

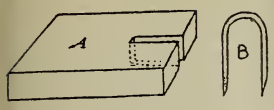
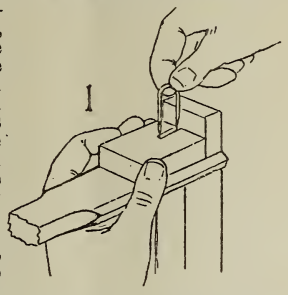
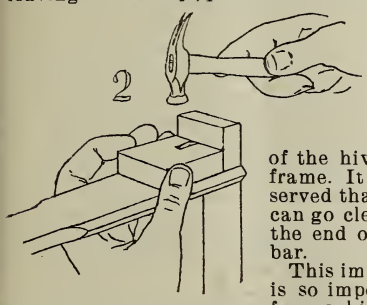
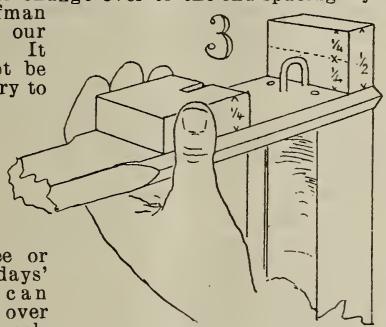


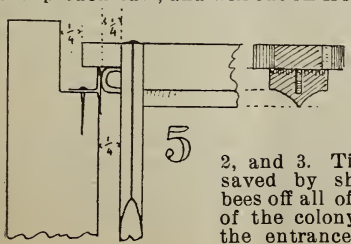
FIG. 6.





This improvement is so important and far-reaching in its benefits, that, just as soon as spring opens up, we shall change over to the end-spacing style of Hoffman in all our yards. It will not be necessary to discard our old frames filled with comb. One man, in three or four days' time, can change over all our colonies. He will carry along with him a light *sharp* back-saw, and will cut off from each end of the top-bar ¼ inch, and then drive in the staple as per the plan shown in Figs. 1, 2, and 3. Time can be saved by shaking the bees off all of the combs of the colony in front of the entrance and then change the frames, after which proceed to the next colony. All surplus combs not in the hives can be change ove now in the shop.





The beauty of this improvement is that every one can adopt it for his own yard, where he has old-style frames; and the benefit is so great that it does not seem to me that any one can afford not to use it. We have already changed ove a few of our hives sufficient to know that the work of changing over end-spacers is but slight comparat vely. We will furnish the gauges A and the staples B at a nominal sum. By the way, the staple B is not shown its fu size o wire. It is, in fac No. 16 wire, and ¾ inches long, made to order, with prong extra wide apart.

My, oh my! how are these cold snaps affecting the bees? Ours are all right; but how are yours?

We have so much matter that I find it necessary to cut down the usual editorial space in this issue; and even now I have enough contributed matter on hand to make up almost two whole journals yet. Our contributors will therefore understand why some of their articles have not yet appeared.

OUR SYMPOSIUM; POSSIBILITIES ALONG THE LINE OF THE NEW COMB.

In this issue we have two short symposiums —one on the ubject of tall sections, and the other on drawn or partly drawn combs, or, perhaps, it might more properly be styled deep-cell foundation with side-walls and bases as light as natural. Just exactly what we may expect from this new product it is impossible at this time to foreshadow. If it shall be feas ble som t me n the future to furnish it the same as we do foundation, and at a price within the reach of bee-keepers, great things are possible. Here are a few of them: 1. Bees going into comb honey supers sooner; 2. Securing section honey during off years, when the bees would not draw out foundation; 3. Partial prevention of swarming; 4. Being able to produce comb as cheaply as extracted; 5. Lessening the adulteration evil in proportion to the reduced amount of extracted honey on the market. If as much comb can be produced as extracted, and at a better price, it will be produce more arge y; and as retailers and commission men can not adulterate honey in the comb as they can extracted, the bulk of the honey will be the direct product of the hive.

Now, understand that I state that these are only *possibilities*. While it is possible to produce the new deep-cell foundation in a small way, it may be utterly impossible to make it in sufficient quantity to put it on the market as an article of sale, so we will not

count our chickens before they are hatched. It may be well, however, for us to consider now the mere possibilities, so that those who secure samples can experiment along the lines indicated in 1, 2, 3, 4, and 5.

ANOTHER COMMISSION MAN.

MR. O. L. HERSHEISER, Vice-president of the U. S. B. K. U., which is to meet next in Buffalo, it will be remembered, was a bee-keeper who graduated at the Michigan Agricultural College at Lansing, under Prof. Cook. Indeed, I believe he had charge of the college apiary while he was there. He was superintendent of the New York exhibits at the World's Fair; and at present he is an attorney in Buffalo, N. Y., 410 Real-estate Exchange. He has been fighting a certain commission man by the name of Wm. H. Unger, operating under the firm name of Unger & Co., Michigan St., Buffalo. A long tale of this man's misdeeds are set forth in the *Evening News* of Saturday, Jan. 9th. A single paragraph will suffice.

Here is the story of a man who was once arrested for petit larceny and fined $50 by Judge White, of the Supreme Court, twice arrested for assault (once fined $20 by Judge King), now at large on his own recognizance, having been arrested by United States Deputy Marshal Kane, charged with using the government mails for the purpose of defrauding farmers, and the climax of whose career is the offer of a bribe of $2.00 and a box of figs to a young reporter to suppress the news of his arrest, and an attempt subsequently to assault the reporter because the fact was printed. Not satisfied with this, he made a statement to another afternoon paper that the aforesaid reporter had tried to blackmail him.

There are other commission houses in the city of New York that seem to be working on the same line; and it seems to me that bee-keepers by this time ought to know better than to send their honey to unknown firms. Don't trust your honey with them, even if they do appear to give good impressions, and talk about their ratings in Dun and Bradstreet. If there are any other chaps like this man Unger in Buffalo, I am sure our friends will know to whom to look in the way of counsel.

FOUL BROOD IN FOUNDATION; APICULTURAL EXPERIMENTS.

SOME years ago the suggestion was made that there was a possibility of transmitting foul brood through foundation; but at the time, we all felt (without making any definite tests) that there was no danger from this source; but Mr. R. F. Holtermann, in the employ of the Ontario government, has been conducting a series of experiments along the line of bee-keeping, and among them was this regarding the possibility of transmitting foul brood through foundation. He selected a very bad case of foul brood, combs being fairly rotten with the disease. These were melted up by very low heat — just sufficient to cause the wax to come to a liquid condition, sufficient for dipping. Sheets were secured from this wax, and they were rolled out into foundation. This was put into a healthy hive, and the results watched narrowly. The whole season went by and no infection followed. When it is remembered that, in the process of ordinary foundation-making, the wax is brought to a much higher degree of heat than the mere melting-point—about 142—it will be seen that there can be no possible danger of contracting the disease through foundation.

FORMIC ACID IN HONEY.

Another experiment was along the line of determining the amount of formic acid in different qualities of honey, obtained under different conditions. He secured a number of samples from different sources—some when the honey was stored rapidly, and some when brought in little by little. These were placed in the hands of a chemist, and tested for formic acid. It was found that there was more of the acid in some honeys than in others, and that there was twice as much in buckwheat as in ordinary white clover. Mr. Holtermann told me that he had always observed that bee-stings were more painful during buckwheat season than at any other time, and wondered if the larger amount of formic acid in buckwheat honey itself, upon which the bees feed, would explain it.

I had always supposed that there was formic acid in honey, but I was not aware before that there was any definite proof. The presence of this acid is probably due to the process of digestion in the honey-stomach of the bee; and—well, I'll not say more for I feel as if I were floundering in the dark. Perhaps Mr. Holtermann or the chemist or Prof. Cook will enlighten us further.

I received the above facts from Mr. Holtermann by word of mouth while he was here a few days ago. By the way, Mr. H. expects to secure the appointment to the position of apicultural experimenter for the general government of the Dominion, at Ottawa. He would be a good man for the place, and I know his friends will be glad to hear of his appointment, which now looks reasonably certain.

MENTHOL honey cough-drops is a preparation on the market that tastes strongly of honey and menthol. An acquaintance, troubled with a hacking cough, tried them and reports that they seemed to give relief. Perhaps there are others who would like to try them, as I understand they are on sale at confectioners' shops. We as bee-keepers need to encourage the sale of any legitimate article of merit having honey as an ingredient. This is not a "paid puff;" indeed, the J. P. Annen Candy Co., of Green Bay, Wis., who put them up, know nothing of this notice.

IF your bees are short of stores, and you have no combs of sealed honey in reserve, lay on the frames under the quilt a chunk of Good candy, made by kneading powdered sugar and honey to a stiff dough.

OUR HOMES.

Be thou faithful unto death, and I will give thee a crown of life.—REV. 2:10.

I had just finished a nice supper, Christmas evening, and the neat and obliging waiter of the pretty restaurant had marked the price "35 cts." on a slip of white paper. As I walked toward the desk I put a half-dollar, as I supposed, with the paper, and laid both on the counter, without saying any thing. The clerk touched his machine. It showed up 35 cts. all right; but instead of handing me 15 cts. only, he gave me *another* half-dollar with the 15. My first impression was that I must have given him a *whole* dollar instead of a half; but while I was meditating on it the coins were in my hand, and, being in a hurry, I passed out. Now, I am going to tell the truth about it, as near as I can. While I was going out, self (or *Satan*) suggested, "It is his own job, any way; this trip is costing you quite a good deal; every half-dollar counts; you have got to be a little saving."

By the way, friends, Satan *does* get on a saving mood sometimes. You will remember his suggestion to Judas about being "saving." The trouble is, he always advises saving money that belongs to somebody besides his victim. I was outdoors and had my hands on my wheel; but another and far different voice was saying, "You had better lose a hundred times the amount than wrong your neighbor, even if he did make the blunder. How about your favorite text, of 'being faithful unto death,' and your teaching all along in that line?"

Then it occurred to me that he could probably tell, even yet, what it was I gave him. I went back inside.

"Sir, can you find the coin I gave you just now when I paid for my supper?"

He opened the drawer, snapped his fingers, and colored up.

"I declare, I *thought* you gave me a dollar; but here is only 50 cts. in the box where the dollar should be."

He thanked me very courteously, saying he feared it was not every one who would take so much pains to correct a blunder of his own making; but I presume it didn't even occur to him that *I* didn't correct it as soon as it was made. How does it come that I am tried so much in just this way? Is the great God above trying me (and *you too*, my friend) every now and then, to see if we are trying to be "faithful to the end" in loving our neighbor as ourself? If so, then let us see to it, dear fellow-travelers, that we are not entrapped by the great adversary.

An hour later my ear caught the sound of martial music. It was the Salvation Army. As it was Christmas evening there were quite a few on the streets, and quite a crowd collected around them. A good many did not seem to understand them. Most of them were smoking, some had been drinking, and coarse talk and many oaths were mingled with the beautiful hymns that were being sung. They (the army-workers) finally all knelt in the dusty street; and while a woman was praying for the rough crowd around, one fellow, more curious than the rest, pushed through the circle and came close up to the one who was praying. He looked first at the crowd outside, whom he *could* understand, then at the little flock on their knees whom he could *not* understand. Let me digress a little right here.

During all my life—that is, all my Christian life—I have longed for something or somebody who could bridge the gulf between the hard unbelieving world and true, honest, earnest *Christians*, and make the scoffers comprehend what Christianity really is. It wants grace—oh such an *amount* of grace! to enable believers and unbelievers to even converse together in a neighborly way. Let us consider the scene I have pictured. This stranger stands leaning over the woman on her knees, looking *down* upon her, probably in pity. He has taken his cigar out of his mouth; and while he puffs a cloud of smoke all over those on their knees, even into their very faces, he looks round inquiringly. I think I can understand the look. To me it seemed as if he were saying:

"Why! what are these blank idiots up to, any way? What is their game?"

The prayer did not attract so many; but when the captain stepped on a chair, and sang one of the sweetest hymns I ever heard, accompanying it with a guitar, they all came thronging back. All at once I was startled by most horrid oaths right at my elbow, and in a *woman's* voice. Omitting the oaths, she said:

"They lie, every one of them. They ain't a bit better than I am."

I came pretty near smiling at this, for it seemed a little as if she was, to use a slang phrase, "giving herself away." She resumed, "They won't hold out, any way; see if every one in the lot don't go back, before *next* Christmas."*

Oh how I did pray inwardly for God's grace to be poured out on that little band, and that they might have the Holy Spirit as on the day of Pentecost, so that all that hard crowd might hear the gospel explained in a tongue they could understand and comprehend. My prayer seemed answered. The woman's fling was taken up. First one and then another replied in substance:

"Watch us and *see* if we don't hold out." "We *want* to be watched." "Some of us have been in the blessed work for many years. We appeal to the crowd. Have any of you ever known a crooked thing in our past record?" No one answered, and then a new recruit took the stand. His testimony was something as follows:

"Friends, this is the first Christmas that I have passed, as a sober man, for 25 years. Just a year ago to-night, I, with a few of the same sort, were engaged in 'painting the town red.' Last June my friends had all given me up; I had given myself up; but these friends here picked me out of the gutter, told me of Christ Jesus, and here I am, by the grace of God."

Even after this, several voices from the crowd declared he wouldn't "hold out." "Boys," said he, "many of you know me. Is it not true that I have been a drinking and profane man for 25 years?"

Many answered, "You are telling the truth now, Jim." "We'll back up that statement."

"Well, has any one of you known of my drinking a drop since these good people lifted me up and had compassion on me?"

Not a voice answered.

After this converted man had finished speaking, one of the officers of the army arose and spoke something like this:

"Friends, this man tells you that, one year ago to-night, he helped to 'paint the town red.' He did not add, but I will do it for him, that to-night he is helping to wash the town white—not whitewashing, mind you. The Salvation Army does not deal in whitewash—we have no use for it; but he, with the rest of us, are try-

* This woman's talk made me think of the words, "And, behold, they cried out, saying, What have we to do with thee, Jesus, thou Son of God? art thou come hither to torment us before the time?

ing to wash the town white in the blood of the Lamb—Christ Jesus."

Then I thought of the words, "Purge me with hyssop, and I shall be clean; wash me and I shall be whiter than snow."

As that swearing and drinking crowd of men and women gazed at that little band of Christian workers, it seemed to me that my prayer was answered. The dullest and most obtuse one in the lot could and must, in fact, understand what it meant to be washed clean from all their sins and iniquities. It seemed to me that I never comprehended before so vividly the difference between sin and godliness as we had it there pictured before us. Taking that crowd as it stood, and considering the matter of cleansing them from all their sins and depravity, I should have said, humanly speaking, that it could not be done—that it would be a physical impossibility; and yet the brother's words, which he had just spoken, were still ringing in their ears. The marks of years of dissipation were like furrows, and left their tracks on his poor face; and yet he was actually pleading to have them give up their sinful lives and sinful ways, and trust Christ Jesus. I never before in my life saw such a direct hand-to hand conflict betwen Satan and Christ Jesus; and it seemed as though at least once in the world the opposing forces had met. There was not any abstruse doctrine discussed—at least nothing difficult to understand; but it was the one plain simple question, "Will you throw up your old sinful life, and march with us under the banner of Christ Jesus?" Then I thought of the words of that old hymn—

Now wash me, and I shall be whiter than snow.

Other similar testimonies followed, and they were all in a line to support the promise in the text I have chosen. Some of the hymns would have done credit to any concert I ever attended; and after they adjourned to the hall the captain gave us a short sermon that, in my opinion, would do credit to any pulpit. Doubtless unusual preparation was made, it being Christmas night.

I stayed so late at their meeting in the hall it was a little after my usual time when I closed my eyes in oblivion, thinking my conflicts with the prince of darkness were over, at least for that day. Not so, however. I was so tired and sleepy I retired without first opening the window for fresh air, as I usually do. Toward midnight I awoke, feeling the air in my room was not exactly what we get when—camping out under the stars, for instance. Before the closed window was a heavy paper curtain. As this failed to run up out of the way as it should do I held it back with a chair; then as I could not pull the window up, nor find the fastening, I turned on the electric light. Even then I did not succeed in getting the window loose; and to get a better chance I stepped up on the sill. Let me explain that the building was like many in hot climates with adobe walls—two feet thick or more, the windows of the lower story being quite near the ground. Well, as soon as I was up on the sill I found the fastening; but before I touched it I saw that I had attracted the attention of some one at a little distance across the common outside. This some one proved to be a finely dressed woman, and she was tripping swiftly toward my window with its blazing electric light. I stepped down very quickly, removing the chair so the paper curtain covered the window very completely. Tap, tap, tap, came on the glass. I stood very still, and hardly dared breathe. If I didn't answer or move she would surely go away, I thought; but she kept tapping. Finally she essayed to raise the sash; but as *I* could not start it from the inside, I felt quite safe. Imagine my consternation when I heard it go the very top with a rush as soon as *she* touched it. I moved a step or two behind the washstand, while I asked quietly what was wanted. She pushed the curtain aside enough to show her face, and said, as she smiled in an apparently innocent way:

"I only wanted to wish you a 'merry Christmas.'"

"You have done so; now go away; goodnight."

"Don't be cross," she added in a lower tone, with something else. Satan in bodily form stood before me, and gave me a brief glimpse of what *he* could do in getting *man*kind to fall at his feet to worship him. I stopped her by saying, "There, that will do;" and at the same time I backed toward the door on the opposite side of the room. I made up my mind very quickly that she and I would never be seen in that room together, not even by the holy eye of the great God above. When I started to put out my hand toward the door, then she went away. Was this another test to see if I would be "faithful unto death?" In the early evening I had witnessed what woman can do to *raise* fallen men; the last few minutes had given me a view of what Satan can do, with woman's help, to drag men *down*. Under other surroundings and circumstances I should have called this one of the brightest and handsomest women I ever saw; there was a fascination about her looks that, rightly used, might have been a great power for good. I could only groan in spirit as I looked at her. "O God! is it *indeed* true that some of the fairest and brightest of womankind have *sold themselves* to the work of ruining the world?"

It sometimes seems as if no power on earth were sufficient to warn men of the danger of trifling with intoxicants, and it is the same with this other evil. Had I lost my hold in climbing Superstitious Mountain, and been dashed on the rocks, there would have been some mourning, especially among my intimate friends; but had I fallen in this other way, my memory would have hardly been worth a funeral at all. A man had better die an honest, innocent death, a thousand times better, than march boldly on to disgrace and ruin. See what God's holy word says about it:

"Can a man take fire into his bosom and not be burned?"

"But whoso committeth adultery with a woman lacketh understanding: he that doeth it destroyeth his own soul."

"For she hath cast down many wounded; yea, many strong men have been slain by her.

"Her house is the way to hell, going down to the chambers of death."

Mrs. Root made me a present of a book. She sent it by mail, so it reached me on Christmas eve. I like it so much I should be glad to have it read by every one who reads GLEANINGS.* The leading character of the book is a minister who spent his life in hardship in "being faithful unto death," and near his end he uttered the following prayer while alone by himself:

"Lord, I have groped after thee, and to know thy will, and to do it if I could. I never expected to be happy. Dost thou mean this draught of human joy for me?"

It almost startled me to read it, because several times, recently, I have used much the same sort of prayer myself. You see our friend had "been faithful," without any thought of reward, and when he breathed that prayer he

*The book is, "A Singular Life," by Elizabeth Stuart Phelps.

was just getting a glimpse of the "crown of life" that comes in in the latter part of our text.

"Be thou faithful unto death, and I will give thee a crown of life."

Mr. L. B. Bell, of Camp Verde, Ariz., has charge of two apiaries belonging to Mr. F. E. Jordan. Mr. Jordan is now living in Jerome. More of him anon. Mr. Bell does not get so large a yield of honey by considerable as they do in alfalfa districts. His yield during the season just past was only about 70 lbs. per colony. Their honey is gathered from mesquite and other plants of the desert. The quality of the honey, however, is exceedingly fine; and in Jerome, 30 miles away, he gets for his whole crop 7 cts. a pound. This is nearly double, you will notice, what they get in the Salt River Valley; but it has to be transported all this distance by wagon.

Mrs. Bell was, before her marriage, a schoolteacher in the far West. And, by the way, this rough far West is more indebted to the schoolma'ams who have gone away out there to teach than perhaps it will ever realize. And may I suggest right here that I fear that some of the men who have succeeded in getting these schoolma'ams for wives do not always realize how much they have to thank God for? Some of them do, however, evidently, and Mr. Bell is one of these. If I am correct, one reason why he chose that desert land for a home was because of what I have already mentioned—that is, the mother died of consumption, when he was almost too small to remember her very well. He is now rugged and strong, and I should be almost willing to spend the rest of my life in Arizona if I thought I should be able to acquire the endurance to wind or weather, that he seems to possess.

We arrived at his home Jan. 1. In the afternoon we started out to explore some of the ancient cliff-dwellings only a few miles from his home. These dwellings are scattered more or less all through Arizona. The first essential is a cliff. Now, whether the natives in olden times dug back into the chalky rock so as to form caverns, or whether these caverns were made by some flood in former ages, I am unable to say. My impression is, however, that the caves were, at least mostly, washed out by water. The dwellings are usually found where there is a soft stratum of chalky rock between two harder strata or layers. These are never found very near the ground—generally from 30 to 40 feet, and often 100, and in extreme cases 400 or 500 feet from the level. Usually the cliffs are inaccessible unless one uses a ladder, or walks along on the edges of the shelving rocks. Almost every time when I looked at these homes made by that strange race of people a thousand years ago, I would say, "Well, I am pretty sure I should not be able to get up there without ladders or some sort of assistance along that line." But Mr. Bell, our pilot, replied that we could reach every one of them if we hunted up the path used by the cliff-dwellers of old.

A good many times we found holes in the rocks, probably made for the hands, so as to enable one to climb along the dizzy heights. The rooms are usually a sort of cave back in the rock. The opening to these caves is closed up with pieces of rock and mortar, very much as a stone mason lays a wall nowadays. They did very little stone-cutting, however. The chalky rock pounded up seemed to furnish the mortar. Instead of cutting the rocks with stone-cutters' tools they evidently selected such as were fit for their purpose, and showed much skill in laying them so as to have a smooth wall, outside and in. This wall not only closed up the entrance of the cave, but it divides off the rooms inside, or divides one man's house from that of his neighbor. The doors of these dwellings are all low; in fact, it is tiresome, on account of the constant stooping, to explore them. Some of the largest are high enough inside so one can stand erect; but in many of them you will be obliged to sit or stoop down. They are blackened more or less overhead by smoke, and I might almost call it the smoke of ages, for the room still smells of smoke, even though hundreds of years have past since any fire was built. In some of the largest and finest, places for beds or couches were worked out of the solid rock. Much of this work is obscure, however, on account of the great quantities of bat manure that cover the floors. In some of the buildings it is at least a foot deep. Everybody seems to acknowledge the value of this bat guano, or manure; but the expense of hauling it to a railroad station, and then paying the cost of transportation, stands in the way of its utilization. In one of the extensive cliff dwellings, in their search for relics, it seems to me a full carload of the guano was shoveled out in a heap. Under the influence of the rain it seems to have softened up into a material that looks very much like old well-rotted manure. Our readers may remember that we have already used bat manure, shipped in from some of the Southern States, in our greenhouse experiments.

There have been many conjectures made, to the effect that these cave-dwellers were small in stature. None of the mummies are larger than would be those of children ten or twelve years old. The ceiling to the dwellings would accommodate people of about that height, and their doorways likewise. But it should be remembered that many races, even at the present time, have low doors and low ceilings. They stoop when they go inside, and usually sit on the ground instead of on chairs, as civilized people do. But, to go back to the cliff-dwellings.

One of the most interesting features connected with every one of these old-time homes is one or more little closets opening into the main apartment. These closets are egg-shaped, and are made far enough into the rock so the opening can be closed with stones and mortar; then after it is plastered over with thin mortar, something like whitewash, one would never dream of the existence of this cupboard or closet were it not that the wall sounds hollow when you pound on it where these are found. It has been suggested that these were made for storing their grain. When walled up it was secure from rats, mice, and insects; and in the dry rock it would probably keep several years. On the top of the cliff we found the remains of dwellings made entirely of stone walls. Where these were exposed to the weather, the roof had long ago fallen in and rotted away; but in one place we found a piece of timber over a doorway, and it was still sound. Mr. Bell recognized it as a very durable wood found on the desert. As quite a number of mummies of these ancient people have recently been found, we saw evidences almost everywhere of where the pick had been used in searching for relics.

In almost every one of these dwellings we find little shriveled-up corncobs. It seemed to

me as if they had a kind of corn smaller than any thing we have now in cultivation, for these cobs were not even as large as that from the smallest ears of popcorn. I could not learn that anybody had ever succeeded in getting any of the grains of corn of this kind. If one could find one of these granaries full of grain, that had never been broken open, it would be indeed a valuable "find." These people raised crops, for the old irrigating-canals are found all through the valleys. In fact, quite a few times these same old ditches have been utilized for modern irrigation, and the engineering ability displayed in leading the water on to the land seems to be about equal to any thing of modern times.

The last of my notes in our last issue were penciled while I was ensconced in the hollow of a rock. As I had something of a cold I found a place out of the wind, and in the sun, where I could warm up and write in comfort. The rest of our party were off on the snowy mountain-tops hunting. Right across the river from where I was writing was a considerable town of cliff-dwellings. After the men returned, Mr. Bell said we must certainly visit these, because there were some particular features about them different from those we had visited the day before, that I have just described. The question was, how to get over there. The bank was too steep to get the wagon down; but our horses, being used to mountain-climbing, got down without any trouble. We were to cross the river on horseback. I demurred some, fearing the bottom might prove treacherous. Mr. Bell, however, took the gentler of the two horses and rode it through the river back and forth several times. When I saw him raise his feet so as to keep them out of the water I felt considerably nervous at the undertaking. However, we got across all right, and found so much that was wonderful and strange that it was toward sundown before we started to go back. I suggested he should take the same path back through the water so there could be no danger of an accident. We had just got to the point when we were both advised to double up our knees so as to keep our feet out of the water, and were discussing whether we were exactly on the old track. The rushing waters began to make me a little dizzy, and at last I thought it was my imagination that made it seem that the horse was rolling over. In a second more, however, I had to face the stern reality. Mollie got her hind feet into a little spot of quicksand, and with two men on her back she was hardly equal to the task of getting out. I was so used to springing from a wheel and alighting on my feet that I involuntarily sprang from the horse in the same way, and I alighted in the water all right, on my feet; but Mollie, as she went over, struck one of my legs, and there was no help for it—I had to go down in that raging flood of icy-cold water. Mr. Bell, however, spoke quickly and sharply to Mollie; and as he slid off she rallied, and my leg was released almost as quickly as it was pinned. Here was a dilemma. I was pretty well soaked, and we were eight or nine miles from home. Mr. Bell's buoyancy of spirits cropped out even then and there, however. While we were wading out through the rushing water, in a dismally comic tone he said:

"Well, Mr. Root, who would have thought that you and I would have 'fallen out' so *soon*, and on so short an acquaintance as this?"

In spite of the water that was dripping from me all over, the comicality of the scene struck me so that I laughed till my laughing helped at least a little to keep me warm. As I approached the wagon I asked Mr. Carey, the Quaker, to pull a cushion from the wagon-seat and lay it on the sand. He seemed to be a good deal worried, but took in the situation, and down I went on the cushion, on my back. Then I raised both feet so as to let the water run out of my boots. I was in such a hurry that I forgot to pull my pants well above my boot-tops, and down went the icy water into my trousers-legs, wetting my clothing, which was comparatively dry until then. We soon learned wisdom, however, and when the last drop of water had dripped from my boots I sprang on to my wheel and started over the desert sand to get up a circulation. After going over a mile I found a farm-house. The people were all away from home except some girls. I hastily appropriated the big open fireplace, and asked the girl to help me wring out some of my clothing. We were soon acquainted, and got things fixed in pretty fair shape. At this time the wagon had just come up. Some of the girls said a flock of wild geese were down in the field feeding on alfalfa. Now, Mr. Elvey was the hunter of the crowd; and if you want to see him up and dressed in a second, just tell him there is game in sight. The question was, should they bother with the geese when I was in such a plight, and a dark night coming on? I could not keep that desert road after dark; and, furthermore, that Verde River would have to be crossed again about a mile from home. I told them to never mind me, but go and get the geese, and then make the horses do their very best to catch up with me shortly after I should reach the river. I made the seven miles, and reached the river just as it was getting too dark to keep my wheel off from the thorns and cacti. But I tell you I made that wheel fly. I was warm and comfortable, but getting pretty well tired from so much wet heavy clothing. I reached the river, and decided there was no other way than to ride back until I should meet the team, even though it was getting to be too dark to see. Before going many rods I met the team, coming up on a gallop.

"How many geese did you get?"

"Didn't get any geese, but we made the feathers fly," said the Quaker.

Somebody else replied, "It is true, the feathers *did* fly—when the geese did, as they always do." And then it transpired that they felt so anxious about me they did not wait to get within decent range of a flock of fifteen or twenty wild geese. These fowls are ravenously fond of alfalfa, and will return to a field again and again, even after having been driven away by firing at them.

I reached the friendly home of Mr. Bell in pretty good trim. By chance a roaring fire was ready, and I was soon safe from harm. The next morning I think I was rather better if any thing. The plunge bath of icy water did me no harm. And here is a lesson for us, friends: In cases of this kind, when you get into the water nothing is necessary but to keep up the temperature by means of brisk or violent exercise. If you can not do any better, walk briskly till you can get shelter. A drink of hot water may be all right, if the patient can be afterward protected from the weather. Usually a brisk walk will of itself keep one from taking cold.

THE SEVERE COLD, LAST WEEK IN JANUARY.

During the past few days the thermometer has been down *16 degrees below zero;* at least, that is what it recorded Monday morning—the